VANDEN WYNGAERD, Guido; DE CLERCQ, Karen; CAHA, Pavel. Late Insertion and Root Suppletion. *ReVEL*, edição especial, v. 19, n. 18, 2021. [www.revel.inf.br]

Late Insertion and Root Suppletion[1]

Inserção Tardia e Supleção de Raiz

Guido Vanden Wyngaerd[2]
Karen De Clercq[3]
Pavel Caha[4]

guido.vandenwyngaerd@kuleuven.be
karen.de-clercq@u-paris.fr
pavel.caha@phil.muni.cz

RESUMO: Este artigo propõe uma abordagem de inserção tardia Nanossintática para a supleção de raízes. Nós mostramos que essa teoria nos permite explicar a supleção de raízes dentro de uma teoria da gramática estritamente modular, que não faz nenhuma diferenciação sintática entre raízes distintas. Como ponto de partida, focamos primeiramente nas dificuldades arquitetônicas que surgem em uma teoria modular das raízes na abordagem da Morfologia Distribuída. Em seguida, demonstramos como a Nanossintaxe contorna esses problemas e tratamos de duas questões empíricas potenciais para o tratamento Nanossintático (exponência múltipla e localidade), mostrando como, na verdade, elas fornecem suporte para a abordagem proposta.
PALAVRAS-CHAVE: Inserção tardia; Nanossintaxe; Morfologia Distribuída.

ABSTRACT: This article proposes a Nanosyntactic Late-Insertion approach to root suppletion. We show that this theory allows us to account for root suppletion within a strictly modular theory of grammar, which makes no syntactic distinction between different roots. As a starting point, we first focus on the architectural difficulties that arise for a modular theory of roots in the Distributed Morphology approach. We then show how Nanosyntax circumvents these problems, and address two potential empirical issues for the Nanosyntactic treatment (multiple exponence and locality), showing that they in fact provide support for the approach proposed.
KEYWORDS: Late insertion; Suppletion; Nanosyntax; Distributed morphology.

---

[1] We thank Jaehoon Choi and Hyunjung Lee for their help with Korean. We have also benefited from the helpful comments provided by two anonymous ReVel reviewers on a previous draft of this paper. We also thank the guest editors Thayse Letícia Ferreira, Valdilena Rammé and Teresa Cristina Wachowicz for all their editorial work and for translating our abstract to Brasilian Portuguese. All errors are our own.
[2] PhD in linguistics. Professor at KU Leuven, Belgium.
[3] PhD in linguistics. Professor at LLF/CNRS, Université de Paris, France.
[4] PhD in linguistics. Professor at Masaryk University, Brno, Czechia

Introduction

There are several good reasons to adopt a syntax-based Late Insertion model as an approach to morphology (see Halle & Marantz, 1993; Marantz, 1994; and Embick & Noyer, 2007 for a discussion). We start by briefly discussing what we take to be the two most important ones, namely universality and modularity.

Universality refers to the idea that the atoms of syntactic trees (its terminals) are not language specific, but they are drawn from a universally-available set of features. In Late-Insertion models (which place the lexicon after the syntactic derivation), the syntax no longer has to deal with the arbitrary and language-specific objects that lexical items are. Instead, the atoms of syntax correspond to a universal set of features that refer to syntactically relevant semantic distinctions, like ANIMATE, COUNTABLE, PLURAL, etc. Language-particular elements are introduced late through lexical items, understood as unpredictable and language-specific linking between the universal features and a language-particular phonology, and, in some cases, also (encyclopaedic/conceptual) meaning, that is not syntactically relevant. In Late-insertion models, these language-particular aspects of individual languages become available only after syntax, in the process of the 'externalisation' of syntax through lexical insertion.

The second major advantage of Late Insertion is *modularity*. By this we mean the following:

(1) *Strong Modularity Thesis* (SMT)
Syntactic representations only contain entities that are relevant for the application of syntactic principles and operations.

This excludes from the syntactic module everything that is not syntactically relevant, specifically, the phonological, conceptual and encyclopaedic information that is associated with lexical items. To take a concrete example, the difference between *dog* (singular) and *dogs* (plural) is syntactically relevant, as seen in various kinds of agreement processes triggered by nouns, but the difference between *cat* and *dog* is purely conceptual, and is not relevant to any syntactic operation. Late Insertion offers a way to separate the syntactically relevant from the syntactically irrelevant. It provides a type of architecture in which syntax is in principle unable to refer to syntactically irrelevant properties of lexical items like their phonology or conceptual information. On the other hand, if the atoms (terminals) of syntactic derivations were the traditional lexical items, then their phonology (and conceptual meaning) would necessarily be present in syntax as well. This clashes with the insight that neither their phonology nor conceptual information play any role in syntax.

Within Distributed Morphology (DM), this view has been uncontroversial and universally adopted for functional lexical items like the comparative *-er* etc. It has been a common stance to extend Late Insertion also to open-class lexical items, so-called roots. As Marantz (1996, p. 16) puts it "[n]o phonological properties of roots interact with the principles or computations of syntax, nor do idiosyncratic Encyclopaedic facts about roots show any such interactions" (see also the Principle of Phonology-Free Syntax of Zwicky, 1969; Zwicky & Pullum, 1986; and Miller, Pullum and Zwicky, 1997). If Late Insertion is applied also to lexical items like *cat* and *dog*, we derive the fact that syntax cannot distinguish between them either in terms of their phonology or in terms of their conceptual and/or enycyclopaedic meaning.

The syntactic irrelevance of the distinction between roots like *cat* and *dog* has been taken to its logical conclusion in models such as Halle and Marantz (1993), Marantz (1996) and De Belder and Van Craenenbroeck (2015), where syntax contains just a single root symbol $\sqrt{\ }$, which is an object devoid of syntactic, phonological or semantic properties. $\sqrt{\ }$ works as a pure placeholder for the insertion of the morphological root. Concrete root morphemes are inserted late into such a non-discriminate $\sqrt{\ }$ terminal based on a free choice (Harley & Noyer, 1999).

In this context, the issue of suppletion is relevant. Since suppletive roots have, by definition, several phonologically unrelated forms depending on the context, it must be the case that roots enter the derivation without any phonology, and acquire it only once the appropriate context has been determined. As Haugen and Siddiqi (2013), Harley (2014) and Arregi and Nevins (2014) have argued, Late Insertion of roots also allows the theory to deal effectively with root suppletion, while simultaneously maintaining the two advantages alluded to above.

However, within a classical DM architecture (Halle & Marantz, 1993; Harley & Noyer, 1999), this fully modular approach to roots meets two challenges. One is related to competition among roots. The other concerns the proper pairing of conceptual and encyclopaedic information with phonological information (as we discuss in section 1). Because of these two issues, some recent approaches adopt the view that individual roots are, after all, differentiated in syntax. For instance, Harley (2014) (following Pfau, 2000, 2009) uses arbitrary numerical indexes to this effect. While this move solves the two issues noted above, it no longer satisfies the Strong Modularity Thesis as formulated in (1), i.e. it fails to deliver a fully modular architecture, for reasons that we discuss in the body of the paper.

In this context, the main goal of this article is to show that it is possible to account for root suppletion in a universalist, fully modular approach to roots, i.e., without the need to introduce arbitrary diacritics on roots in syntax. In developing a theory along these lines, we will be drawing on the Nanosyntax theory of spellout (Starke, 2009, 2018).

The organisation of the paper is as follows. In Section 1, we discuss some of the main findings emerging from the treatment of root suppletion in DM. We also highlight here two challenges that arise for these approaches. We introduce the architecture of

Nanosyntax (Starke, 2009, 2018) in sections 2 and 3. We show that this theory allows for an approach to root suppletion where neither of the two problems mentioned above arises. By demonstrating this, we show that Nanosyntax allows for an approach to root suppletion where syntactic terminals are both modular and universal. In sections 4 and 5, we defend the approach against two kinds of possible objections. The first objection is that phrasal lexicalisation, on which the theory relies, is not the right tool for suppletion, because it does not allow for multiple exponence. Section 4 argues that it does. The second objection is that it cannot handle non-local conditioning of suppletive roots. Section 5 argues that this is, in fact, a desirable result, despite apparent challenges.

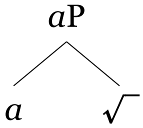
1 Roots and suppletion in DM

In the current section, we discuss two kinds of approaches to roots in DM. In Section 1.1, we discuss an approach that is both universalist and modular. However, this approach faces two challenges: one related to suppletion and another one related to the overall architecture of grammar in DM. In Section 1.2, we discuss an approach that addresses these challenges by differentiating among roots in syntax. Our point is that while root-differentiation is successful in resolving the issues, it does not deliver a fully modular architecture. These considerations form the background to our own proposal that we put forth in Section 2.

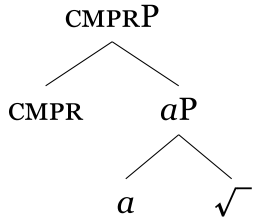
1.1 Two challenges for single-root approaches

This section highlights two challenges facing a fully modular, universalist theory of roots. To make a number of points about root suppletion and beyond, we will be often using the positive and the comparative degree as an example (for a number of reasons, one of them being the fact that this is a well-researched topic, thanks to the work by Bobaljik, 2012). The structures we will be initially assuming are as depicted in (2). More specifically, we will be assuming that the positive degree (in (2a)) is contained in the comparative degree (2b), which adds the cmpr head on top (Bobaljik, 2012). We will decompose the positive degree into a $\sqrt{}$ node and a little *a* node, to maintain easy comparison with existing proposals in the DM literature (but see Vanden Wyngaerd et al., 2020 and De Clercq et al., to appear for a different, root-free type of approach to the bottom of the functional hierarchy).

(2) a. positive



b. comparative



We want to make two points about (2), which relate to the issues of universality and modularity that we discussed in the previous section. The first point is modularity. The trees in (2) show a syntactic representation that is in agreement with the Strong Modularity Thesis of the introduction. To see this, consider the fact that it is impossible to tell from the structures (2a,b) alone what phonology or meaning they represent (as opposed to the roots *nice* or *kind*). This is a good thing, because syntax cannot distinguish these two roots either (in a similar way in which it cannot differentiate between the root *cat* and *dog*). The inability to capture in syntactic representations such irrelevant differences would be a failure by design, because this is what modularity is all about.

Another way to show that the syntax we assume for the positive and the comparative degrees respects modularity is to imagine that we were told to to draw the syntactic structures for the positive degree of the adjectives *kind* and *nice*. With just a single $\sqrt{}$ node at our disposal, both structures would look exactly the same, namely as (2a). This shows that the trees in (2) respect the Strong Modularity Thesis, where information that is irrelevant to syntax is not represented in syntax.

Note that things would be different if we allowed ourselves to use multiple root symbols, one for each root. In such case we would draw different structures for *nice* and *kind*, one with the symbol $\sqrt{\text{NICE}}$ another one with the symbol $\sqrt{\text{KIND}}$. Our point is that when we are able to tell from the syntactic trees which root they represent – without that distinction being relevant for syntax – the Strong Modularity Thesis is violated. This is the case no matter what specific information we use to differentiate $\sqrt{\text{NICE}}$ from $\sqrt{\text{KIND}}$: it could be an arbitrary index, a concept, a phonological string or a combination thereof; the problem remains the same.

The second point about the structures in (2) is that they are universal. Specifically, if all languages have the same ingredients for the positive and the comparative (as proposed in Bobaljik, 2012), it is impossible to say whether the structures in (2) depict the structure of English or Latin roots. This is a good thing too: this is what universality is all about. In contrast, if the trees had symbols such as $\sqrt{\text{NICE}}$ $\sqrt{\text{PULCHER}}$ (Latin for 'beautiful'), we would be able to tell which language we are dealing with.

Despite its good features, some technical issues arise for this view when we try to implement it in the DM model as given in Harley and Noyer (1999). We present their model (with slightly updated labels) in Figure 1.

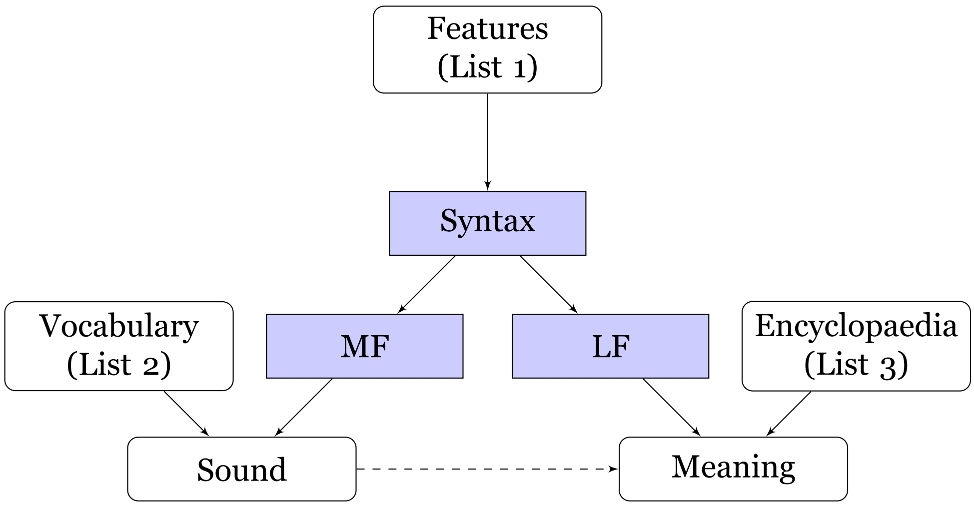


Figure 1: A version of Distributed Morphology (based on Harley & Noyer, 1999)

Figure 1 shows that the syntactic computation begins from features (or feature bundles) drawn from a list that is referred to as List A in Harley and Noyer (1999) and as List 1 in Arregi and Nevins (2014). These features enter the narrow syntactic derivation, where they are assembled into syntactic trees. For reasons that are not directly relevant for the current concerns, DM then splits the derivation of the sentence into two different branches: we have the so-called PF branch (leading from syntax to sound) and the LF branch (leading from syntax to meaning). On the PF branch, various purely morphological operations take place. These may displace, add or remove nodes and features, enriching or impoverishing the structure provided by the narrow syntax. The placement of these operations on the PF branch is motivated by the fact that they do not affect the meaning. The output of these operations is a structure that we refer to as the morphological form (MF), which at this point still consists of abstract features. On the basis of the MF, the sound representation is constructed by consulting the list of exponents (Vocabulary Items, List 2). The two arrows going into the sound representation thus indicate the fact that the sound is determined jointly by the two components, namely by the features that are found at MF, and the list of exponents selected to match the features at MF.

The meaning representation is formed in an analogous fashion. First we construct the so-called Logical Form, LF. Harley and Noyer (1999) are not explicit about how the LF is constructed, but we assume that as in standard minimalism, LF in their conception arises through the application of covert movements such as quantifier raising and the like. In any event, LF is still an abstract syntax-internal representation. All such syntax-internal representations (composed of abstract features and their structures) are marked by the (violet) shading in Figure 1.

As a part of mapping the LF to meaning, the Encyclopaedia is consulted and contributes encyclopedic and/or conceptual aspects of meaning in a fashion analogous to the list of exponents in Vocabulary.

With the basics in place, let us turn to the first challenge. The observation is that the separation of the phonological information (List 2) from the encyclopaedic/conceptual information (List 3) has consequences for the representation of roots in syntax and hence, also for modularity. To see that, recall the fact that the trees in (2) contain just a single root symbol $\sqrt{}$. In Harley and Noyer (1999), all root morphemes such as *cat* and *dog* reside in the Vocabulary, and they are inserted into such a non-discriminate $\sqrt{}$ terminal based on a free choice. Given this setup, the question arises how LF knows what kind of exponent has been inserted at the PF branch of the derivation, so that if *kæt* is inserted from the Vocabulary at the PF branch, the LF learns about this and the Encyclopaedia contributes the right encyclopaedic/conceptual information at the meaning side. What must be prevented is that the non-discriminate $\sqrt{}$ symbol arrives at LF and Encyclopaedia has the power to independently select a particular lexical item, so that, in effect, /kæt/ means DOG.

In order to avoid this, Harley and Noyer (1999) suggest that a direct communication line (depicted by the dashed arrow) is established between the sound and the meaning, which makes sure that the Encyclopaedia knows what information it should provide. The architectural consequence is that sound and meaning are linked both via the syntactic derivation (as is standardly assumed), but also outside of it for the sole purpose of root insertion. The direct communication line between sound and meaning is the first complication that arises in DM when a fully modular approach to roots is adopted.

As we shall see in Section 1.2, there are versions of DM that do not need such a direct communication line between sound and meaning. However, we will also see that the price one has to pay for eliminating it is that roots must be differentiated within syntax, which is something that we avoid in our own proposal in Section 2.

Let us now turn to the second challenge that a theory based on non-discriminate roots faces. It comes from root suppletion and the related notion of root competition. In the DM framework, root suppletion, as in the pair *good-better*, is accounted for by contextual specification of Vocabulary Items (VIs), which insert phonology under the terminals, in this case the $\sqrt{}$ node. We need two distinct Vocabulary Items for the suppletive pair *good–bett*; they are as in (3), which are slightly adapted from Bobaljik (2012) to fit the trees in (2) above:

(3) a. $\sqrt{}$ ⇔ *bett-* / ___] *a*] CMPR]
 b. $\sqrt{}$ ⇔ *good*

In the positive degree, these VIs are not in competition with each other, as there is no CMPR head there, so that only (3b) meets the structural description, and *good* will be inserted. In the comparative, given in (2b), however, a competition between (3a) and (3b) will arise, since the structure generated in syntax meets the structural description of both rules. The outcome of that competition is determined by the Elsewhere Principle (Kiparsky, 1973, Halle, 1997, p. 428), which states that a more specific rule takes precedence over a more general one. Since (3a) is more specific than (3b), it wins the competition in the comparative. As a result, *bett* is inserted in the comparative. The CMPR head is spelled out as *-er*, yielding the form *bett-er*, little *a* being silent.[5]

Now the VI in (3b) as currently formulated is just a fragment of the English Vocabulary. If left on its own, it will insert *good* under any terminal $\sqrt{}$ node. One way of extending our fragment will therefore be to add more roots:

(4) $\sqrt{}$ ⇔ *good, nice, happy, small, intelligent, bad, …*

What this extended rule achieves is that there is a free choice of insertion of a variety of roots in the positive degree under $\sqrt{}$. But now a problem arises with respect to the 'suppletive' rule (3a): since it is more specific than (3b), it is also more specific than the extended rule (4) (which is in relevant respects like (3b)). The result is that *bett-* will be inserted under $\sqrt{}$ in any comparative structure (outcompeting not only *good*, but also other roots), obviously a wrong result. This problem in the analysis of root suppletion was pointed out by Marantz (1996), and it is a consequence of the format of the rule (3a): it basically says that *any* $\sqrt{}$ has the form *bett-* in the context of a comparative.

This issue is still a matter of current research in DM (for an overview of possible options, see Haugen and Siddiqi, 2013, p. 514). The earliest solution, suggested by Marantz (1997), held that root suppletion does not exist, except in the functional vocabulary, where the competition problem can be easily solved. In Marantz' idea, the Vocabulary Item *good* would spell out a syntactic terminal which is crucially not a contentless $\sqrt{}$ node, but a node with at least one functional feature (represented as an evaluative feature with a 'positive' value in (5)).

(5) a. [EVAL:POSITIVE] ⇔ *bett-* / ___] *a*] CMPR]
    b. [EVAL:POSITIVE] ⇔ *good*

Once (5) is adopted, then nonsuppletive adjectives can be inserted by the free-choice rule (4), since (4) would no longer contain *good* as a choice (since *good* now has the entry (5b)). As a consequence, the VIs in (5) only compete with each other, not with (4), and one thus gets rid of the problem where *bett-* would compete with nonsuppletive roots like *nice*.

However, empirical evidence against this idea has been presented by Harley (2014),

[5] Arregi and Nevins (2014) discuss interesting cases where the regular comparative form (e.g., *badder*) is not always blocked by the suppletive form (*worse*). Specifically, while *bad* most often has the comparative *worse*, there are also senses of *bad* that give rise to the comparative *badder*. This could suggest that there is no competition between *worse* and *badder*, since both are in fact attested. However, Arregi and Nevins (2014) develop an approach where the regular form *badder* arises because of a syntactic difference between the structures underlying *worse* and *badder*. As a result, *badder* surfaces only where *worse* is unavailable for locality reasons, while in the general case *worse* does indeed block *badder*.

who argues that suppletive verbs in Hiaki have rich lexical meanings, for which an analysis in terms of functional heads is unlikely (cf. Haugen & Siddiqi, 2013). To deal with this issue, Harley (2014) has argued that $\sqrt{}$s are individuated in the syntax, i.e., prior to vocabulary insertion, by means of a numerical index. We shall describe this approach in the next section, noting that while it successfully addresses the challenges identified, it does so at the cost of proposing different syntactic representations for different roots.[6]

1.2 Root differentiation

According to Harley (2014), the pre-syntactic lexicon contains an infinity of different, individuated, $\sqrt{}$s (see also Pfau, 2000, 2009). Free choice of a root is then not exercised at the point of insertion (as in Marantz' approach), but at an earlier point, namely in the selection from List 1, i.e., when the elements that will serve as the input to the syntactic computation are selected. At the point of insertion, the competition is consequently restricted to the VIs that can spell out the particular root symbol selected, e.g., $\sqrt{153}$.

The Vocabulary Items that we shall need under Harley's proposal would then be as in (6):

(6) a. $\sqrt{153}$ $\Leftrightarrow$ *bett-* / ___] *a*] CMPR]
   b. $\sqrt{153}$ $\Leftrightarrow$ *good*

The idea here is that both *good* and *bett-* are two different forms capable of spelling out the symbol $\sqrt{153}$. What this proposal achieves is that *bett-* is no longer a comparative of *just any* $\sqrt{}$ (as it has been in (3)), but a comparative of *one particular* $\sqrt{}$ with a unique index. Once this is the case, the problem with root competition disappears. This is because *bett-* will not be a candidate for any other root than $\sqrt{153}$, and so it will never outcompete *nice*, which spells out (say) $\sqrt{154}$.

This proposal has as an additional benefit in that direct communication between the PF branch and the LF branch of the grammar (i.e. the dotted line in Figure 1) is no longer needed, since the index will be present from the start of the derivation, and be carried through to both MF and LF.

However, the proposal achieves these results as a consequence of adopting indexed roots, so *cat* and *dog* have a different index. In one sense, this proposal is elegant in that syntax still does not operate over roots that are specified for language-particular phonology and/or encyclopaedic meaning: it still has the potential of being universalist (although it would appear to predict that all languages have the same number of roots,

[6] Other solutions are thinkable, but have been shown to be less viable. For example, one could suggest that VIs for $\sqrt{}$ nodes do not compete with each other at all (something which is suggested by the free choice rule in (4)), but such a generalised lack of competition at the $\sqrt{}$ node would lead to the problem that both *gooder* and *better* are generated (Harley & Noyer, 1998).

a prediction that is not obviously true). In other words, the symbol $\sqrt{153}$ is not specific to English, but it is found in all languages (which will, of course, associate a different phonology and/or encyclopaedic content to it). At the same time, the differentiation via numerical indexes is a case that violates the Strong Modularity Thesis, as explained in the discussion below (3). By containing symbols such as $\sqrt{153}$, syntactic representations contain information that syntax cannot process. The index passes intact through the syntactic computation with a single purpose, namely to be used by Lists 2 and 3. So even though the numerical index is more abstract than a root with a concrete phonology, the problem is still the same: we are representing a distinction in the syntax that the syntactic computation itself cannot make use of, in violation of the Strong Modularity Thesis.

To summarise the content of this whole section, let us repeat what is going to be important as we move to our own proposal. The most important observation is that in a system with non-discriminate roots, root suppletion leads to a problem with competition: once *bett-* outcompetes *good*, it also outcompetes *nice*, because *good* and *nice* have exactly the same lexical entry (spelling out $\sqrt{\ }$).

To solve the competition problem, we must be able to uniquely identify the lexical item that undergoes suppletion, and limit the competition to those VIs which stand in a suppletive relation to this particular item. Marantz (who works with just a single $\sqrt{\ }$) makes suppletive items unique by placing them in the class of 'functional' heads, which allows one to identify the unique grammatical feature whose realisation shows suppletion. Harley (2014) suggests that this view is empirically problematic and proposes that $\sqrt{\ }$s are individuated by an index.

Our main objection against individuating roots in syntax is that by doing so, one in fact abandons strict modularity and allows for a theory where *cat* and *dog* have different syntax. This is because *cat* and *dog* have a different index, and syntax could be sensitive to this property (since it is present inside it). On the other hand, if we stipulate that syntax is not sensitive to such indexes, then modularity issues arise.

An additional issue is that if $\sqrt{\ }$s really lack any constant *substantive* property, i.e. something more contentful than a mere index, one needs to seriously wonder why they should be differentiated in narrow syntax at all.[7] The indexation of roots looks like a technical solution to a technical problem, rather than an advance in the understanding of the nature of roots.

In the following sections, we will argue that there is a way to handle root suppletion without the need to differentiate roots in syntax by an arbitrary index, thereby adhering to strict modularity. In order to avoid the competition problem, we too will have to find a way to identify the unique root which undergoes suppletion. The device we are going

[7] In fact, one may wonder why they should be present in the syntax at all to begin with. Since this question is orthogonal to our concerns, we shall leave it aside here.

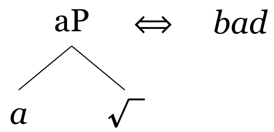
to use to this effect is called a *pointer*, and we introduce it in the next section.

2 Cyclicity and Phrasal lexicalisation

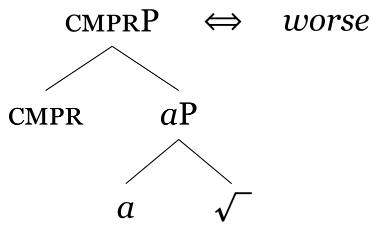
In this section, we describe the main features of an account that allows for root suppletion with just a single $\sqrt{}$ in syntax (or without any $\sqrt{}$ at all, if $\sqrt{}$s are to be eliminated, as in Ramchand, 2008 or Vanden Wyngaerd et al., 2020). What makes such a theory possible is cyclic phrasal lexicalisation, where suppletive items stand in a containment relationship.

In order to present this idea in an accessible way, we will begin with the suppletive pair *bad—worse*, which has been treated by nonterminal lexicalisation also in Bobaljik (2012). We shall then return to *good—bett-er* in the following section. The relevant lexical entries (with the required containment relation) are given in (7). Regardless of the treatment of *bad* (to which we return), the important point here is that *worse* spells out a nonterminal node properly containing the structure that *bad* spells out.

(7) a.



b.



Independent support for (7b) comes from the fact that *worse* lacks the regular CMPR marker *-er*. This is accounted for if its lexical entry pronounces the terminal where *-er* gets usually inserted, as is the case in (7b). Similarly, the reason why *bad* spells out a full phrase is that it shows no overt *a*, differing from adjectives like *risk-y, crapp-y, tin-y* etc.

We will get to the technical details of nonterminal insertion shortly, but the main intuition is this: when syntax builds just the *a*P (corresponding to the positive degree), only *bad* will be inserted, because its lexical entry provides an exact match for the syntactic tree. The lexical item for *worse*, in contrast, is not an exact match: it is too big. 'Too big' may be understood either in an absolute sense (it is not a candidate for insertion at all), or in a relative sense (it is a candidate, but it is too big relative to *bad*, with which it is in competition). When syntax builds CMPRP, only *worse* is an exact match and will be inserted, this time because *bad* is too small (either in the absolute or in the relative sense).

There are several ways of formalising the phenomenon that an exact match gets inserted, and not a lexical item which is either too big or too small. For instance, Bobaljik (2012) relies on the Subset Principle, augmented by Radkevich's (2010) Vocabulary Insertion Principle (VIP), which states that the phonological exponent of a vocabulary item is inserted at the minimal node dominating all the features for which the exponent is specified. On this account, the Subset Principle makes sure that *worse* is too big for the positive, and the VIP makes sure that *bad* is too small for cmprP. Another available option, which we develop and explain later, adopts the Superset Principle (Starke, 2009). For now, the main point is that no matter how the 'too big/too small' difference gets encoded, we initially run up against the same conundrum as the terminal-based proposal in section 1. In order to see that, let us once again turn to the fact that there are a number of roots in free competition with *bad*:

(8) aP ⇔ *good, nice, kind, small, intelligent, bad, …*

a √

Again, the problem is that once syntax builds the cmprP, all of these are going to be 'too small' compared to *worse*. The problem resides in the fact that the lexical entry in (7b) says that whenever the syntax combines the √ node with *a* and cmpr, *worse* will be an exact match for such a constituent. Other lexical entries (like *nice*) might be candidates for insertion as well, but since they are not an exact match for the comparative structure, *worse* will win, independently of how the competition is to be implemented.[8]

However, in the new setting based on phrasal lexicalisation, a new type of solution to this problem becomes available, if one more ingredient is added into the mix. The addition that is needed is that the lexicalisation process, which associates a particular phonology with a syntactic structure, proceeds bottom-up, as in Bobaljik (2000, 2002) and Embick (2010) or Starke (2009, 2018). We phrase this as (9), noting that (9) need not be seen as an axiom, but rather the consequence of two proposals, which are given in (10).

(9) *Bottom-up Lexicalisation*
If AP dominates BP, spell out BP before AP.

(10) a. Merge proceeds bottom up.
b. Lexicalisation applies after every Merge step.

The bottom-up nature of lexicalisation, and the fact that it targets non-terminals is what makes it possible to propose a single-√ syntax that can accommodate root suppletion. In order to see this, consider the fact that lexicalisation (as it proceeds to higher and higher nodes) must keep track of what it has done at lower nodes, so that it can ship this information to PF at some relevant point.[9] In this type of architecture, the problem is solved if we require that the phrasal lexical item (7b) can apply at cmprP *only if* the

[8] Our discussion of this issue is indebted to Michal Starke (p.c.).
[9] This could happen either at the very end of the derivation (as we currently assume), or such shipments can be sensitive to phases, see, e.g. Embick (2010), Merchant (2015) and Moskal and Smith (2016).

lower *a*P node has been lexicalised by *bad*. Equivalently, *worse* is inapplicable if (by free choice of root) we have lexicalised *a*P by a different lexical entry than *bad*.

In order to encode this proposal, let us rewrite the lexical entry for *worse* as in (11), where instead of the *a*P node, we write *bad*. Following Starke (2014), we refer to this device as a pointer. It is an object that is present inside one lexical entry and refers to another lexical entry.

(11) CMPRP ⇔ *worse*

CMPR *bad*

The entry (11) reads as follows: lexicalise CMPRP as *worse*, if one daughter is the CMPR feature, and the other daughter (i.e., *a*P) has been lexicalised as *bad* at the previous cycle.[10]

The idea behind (11) presupposes that the process of lexicalisation has at least two parts: matching (lexical search) and pronunciation (shipment to PF). The crucial point is that the lexicalisation procedure may make multiple searches of the lexicon (leading to the selection of various matching items) before the ultimate pronunciation. Crucially, when a matching lexical entry is found for a given node (say *a*P), this does not mean that this lexical entry is immediately shipped to PF for actual realisation. The match is remembered, and it will eventually be sent to PF; but if later on, a lexical item matching a higher node (say CMPRP) is found, then the first (lower) candidate is not sent to PF at all: only the higher lexicalisation survives. In Nanosyntax, the replacement of a lower match (*bad*) by a higher match (*worse*) is called 'overriding.'

(12) *Cyclic override* (Starke, 2009)
Each successful spellout overrides previous successful spellouts.

As said, overriding means that a matching item at a node XP (*worse*) prevents that any item matching a node contained inside XP (*bad*) is shipped to PF. Overriding is a general property of cyclic bottom-up lexicalisation.

Recall now that from the perspective of a single-$\sqrt{\ }$ theory, the problem with suppletive lexical items like (7b) was that they could override just any root. The pointer device introduced in (11) is here to restrict unlimited overriding: *worse* can only override *bad*. Caha, De Clercq, and Vanden Wyngaerd (2019) encode this by the so-called Faithfulness Restriction:

[10] Pointers are used within Nanosyntax also beyond root suppletion. The reason that led Starke to introduce pointers (in unpublished work) are idioms like *shoot the breeze*. In this case, intuitively, we have a lexical entry that introduces a particular concept (CHAT) when the VP contains the relevant lexical items *shoot*, *the* and *breeze*. In other words, the idiom is to be stored with pointers to these lexical items as: CHAT ⇔ [→*shoot* [→*the* →*breeze*]]. Pointers have also been used to model syncretism in multi-dimensional paradigms (Caha & Pantcheva, 2012; Vanden Wyngaerd, 2018; Blix, 2021), and to deal with issues in nonproductive morphology (De Clercq and Vanden Wyngaerd, 2019).

(13) *Faithfulness Restriction (FR, preliminary)*
A lexicalisation α may override an earlier lexicalisation β iff α contains a pointer to β

To conclude, let us stress the crucial point, which is that we now have a way to account for root suppletion with just a single $\sqrt{\ }$ (or a single A, or, potentially, just functional heads all the way down). To achieve this, we have introduced a bottom-up phrasal lexicalisation procedure. In this kind of system, insertion at the $\sqrt{\ }$ node is free. But once the choice has been made, the Faithfulness Restriction limits the overriding of the initial choice only to lexical items whose lexical structure consists of a pointer to this initial choice. This way, we can restrict *worse* to be the comparative of *bad* using a pointer, rather than an arbitrary index on $\sqrt{\ }$ in the syntax.

3 Phrasal lexicalisation and multiple exponence

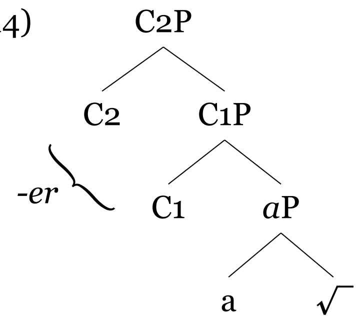
From the perspective of a modular and universal syntax, the zero theory of $\sqrt{\ }$s is that there is only a single $\sqrt{\ }$ (or perhaps no $\sqrt{\ }$ at all, if the bottom of the functional sequence is simply a feature like all the others). In the previous section, we have argued that the problems posed by suppletion can be reconciled with such a modular syntax if cyclic phrasal lexicalisation is adopted. However, an objection that is sometimes raised against the principle of phrasal lexicalisation is that of multiple exponence or double marking, i.e. the phenomenon where suppletion in the root is accompanied by regular marking.[11] This is, for example, the case in a form like *bett-er*, which multiply expones the comparative: once in the root, and once in the suffix. Here our theory faces a conundrum: how can *bett-* spell out CMPRP (as required by the phrasal lexicalisation theory), while at the same time leaving CMPR available for the insertion of *-er*? No such issue arises in a theory with terminal lexicalisation: the suppletive root is an allomorph which is inserted in the context of the CMPR head, and the CMPR head may itself be realised by a separate suffix.

In this section, we suggest a solution to this problem. The solution is based on the observation that in cases where suppletion co-occurs with overt marking, the overt marking tends to be 'reduced', often a substring of a different, nonreduced marker. To see this on an example, let us turn back to English. Here we have *-er* and *more* for the

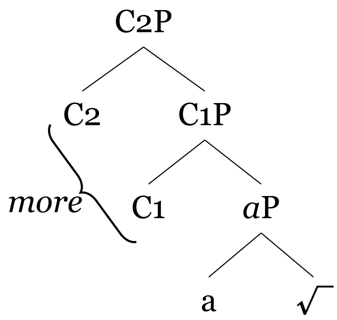
[11] One solution to this issue, suggested for instance in Haugen and Siddiqi (2016), would be to say that decomposing suppletive forms (like *bett-er*) into two pieces is actually doubtful. Such an approach could be supported by the fact that in degree achievements like *to better something*, the 'comparative' *-er* (if it is one) is retained (unlike in, say, *to cool something*), which may suggest that *-er* could have actually been re-analysed as a part of the root. If that is so, the form *better* would be a nondecomposable comparative form in trivial conformity with the nonterminal-spell-out hypothesis. We do not want to dismiss this approach in its entirety: there are clearly cases where suppletive forms are nondecomposable, and we think that these are suggestive of a solution in terms of nonterminal lexicalisation. However, we do not think that such a solution is universally applicable for reasons that become clear as we proceed.

comparative, and *-est* and *most* for the superlative. Clearly, *-er* and *-est* are morphologically reduced compared to *more/most*, if only because they are affixes while *more* and *most* are free-standing items. Further, there are morphological and semantic reasons to think that *mo-re/mo-st* actually contain *-er/-est* as a proper part. Such a containment relation between the two comparative markers can be captured if we decompose the single CMPR node into two heads, C1 and C2, as shown in (14) (cf. Caha, De Clercq & Vanden Wyngaerd, 2019). Reduced comparative marking can now be analysed as expressing only C2, as in (14), while full marking spells out both C1 and C2, as in (15).

(14)

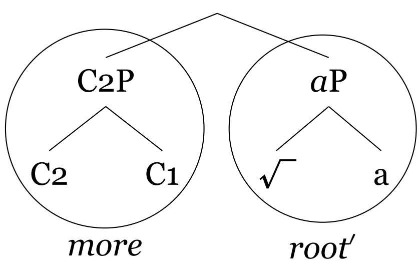


(15)

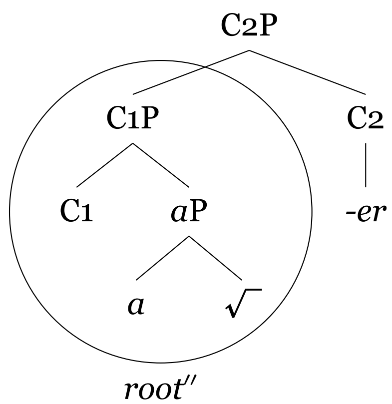


We leave it open as to how exactly lexicalisation applies in the case of *more*, as the main focus is on its complement, i.e. that part of the structure that is lexicalised by the root (but see De Clercq & Vanden Wyngaerd, 2018 for discussion of this issue). We only note that phrasal lexicalisation requires C1 and C2 to form a constituent: this could be achieved by head-movement (Matushansky, 2013), Local Dislocation (Embick, 2007) or by Complex-Spec formation (Caha, De Clercq & Vanden Wyngaerd, 2019), as shown in (16). What is crucial is that this type of marking occurs on top of roots which spell out only the *a*P constituent, as shown by the constituent on the right hand side in (16).

(16)



(17)

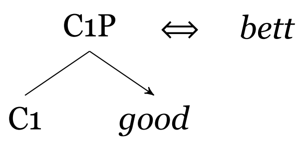


In (17), we show that the reduced marker appears on top of roots which spell out C1P, leaving it again aside how the surface order is derived, as this would take us too far afield (see Caha, De Clercq & Vanden Wyngaerd, 2019 for a worked-out proposal). The crucial point here is the size of the constituent spelled out by the root and by the functional marker. In particular, given that the number of features is constant in (16) and

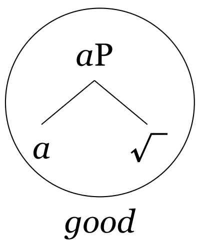
(17), we observe a trade-off between the size of the root and the size of the comparative marker. In particular, we can distinguish between large roots, which spell out C1, and combine with reduced markers. Smaller (*a*P-sized) roots must combine with *more*. The difference between the two classes of roots can be easily encoded in the lexicon: some roots will be specified for C1, others will not.

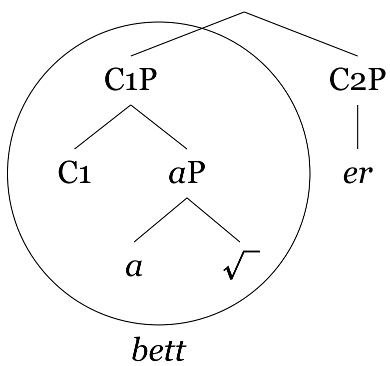
With the background in place, let us now show how a form like *bett-er* can be derived. As a starting point, consider the observation that suppletive adjectives like *bett-er* only occur with the reduced markers (i.e., *-er/-est*) and never with the full markers (i.e., there is no case like **more/most bett*), as observed by Bobaljik (2012). In a theory with a single $\sqrt{\ }$ using pointers like the one we have sketched above, this observation follows. In particular, the tree in (16) (with full marking) is correctly predicted to be incompatible with suppletion. That is because the root in (16) pronounces a constituent (*a*P) that exactly corresponds to the positive. Under the theory with single $\sqrt{\ }$ and pointers, suppletive roots must stand in a containment relation, one overriding the other. Therefore, the comparative root must spell out at least one extra feature compared to the positive, but such a feature is not available in (16), making it incompatible with suppletion.

Turning now to (17), this scenario allows for root suppletion on our account, although it does not require it. We first show how root suppletion works, and then we turn to nonsuppletive roots that combine with the reduced marker. Suppletive roots like *bett* will have an entry like (18), with a pointer to a different root.

(18)


In this case, *good* first spells out the *a*P, as shown in (19), which is a stage of the derivation that corresponds to the positive. If C1 is added, *bett-* is inserted at C1P. This C1P is subsequently merged with C2, yielding the full comparative structure in (20). For concreteness, we place C1P to the left of C2P, reflecting a leftward movement operation of C1P, which we do not discuss in detail here.

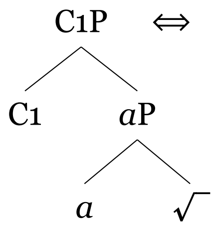
(19)


(20)


We now turn to nonsuppletive roots that combine with *-er*. In order to show how they are accounted for, we shall diverge from our reliance on a broad spectrum of conceivable approaches to phrasal lexicalisation, and focus on one particular version, due to Starke (2009, 2018). The specific component of this theory which we now need, is a matching procedure based on the Superset Principle.

(21) *The Superset Principle* (Starke, 2009)
A lexically stored tree L matches a syntactic node S iff L contains the syntactic tree dominated by S as a subtree

The principle says that if there is an entry like (22), then it can spell out a C1P, as well as *a*P (because *a*P is contained in it).

(22) 

⇔ *old, nice, smart, great, ...*

If a root has such an entry, it can be used both in the positive (i.e., as an *a*P), and, at the same time, appear with reduced marking in the comparative. In English, the adjectives *old* or *nice* would be examples of such roots. The possibility of entries like (22) is what leads us to say that if a root spells out C1P (and thus occurs with reduced marking in the comparative), it does not have to be necessarily suppletive.

To sum up, the theory sketched up to now has two parameters of variation. The first parameter is related to the absolute size of the (morphological) root: it either spells out *a*P or C1P. At the level of data, this parameter distinguishes between roots that combine with *more* and those that take *-er*. The second parameter distinguishes two classes of roots of the size C1P, i.e., two classes of roots that combine with *-er*. The difference is whether the entry for the root has a pointer in it or not: suppletive roots like *bett-* do (overriding *good*), nonsuppletive roots like *old* do not.

Before we develop this concept further, we need to refine the Faithfulness Restriction slighty. Notice first that the entry for adjectives like *old* in (22) is very similar to the entry we have originally considered for *worse*, recall (7b). The problem with (7b) was that it could spell out the comparative form of just about any root, which is why we introduced the Faithfulness Restriction in (13). The FR states that overriding at C1P only happens if the overrider has a pointer to the overridee. As a result, the entries of suppletive adjectives will always contain a pointer to another entry. The entry for the adjective *old* in (22) does not contain a pointer, so it is not allowed to override other roots.

However, such roots do raise an issue related to overriding and faithfulness. In a bottom-up cyclic system, the $\sqrt{}$ is always spelled out first. Here all lexical items that contain the $\sqrt{}$ node are candidates thanks to the Superset Principle, and we let free choice decide. Suppose we choose an entry like *old*. The next step is to merge little *a* with the $\sqrt{}$, forming *a*P, and we again try to spell it out. What we need to achieve is that *old* is inserted at *a*P, forming the positive-degree form *old*.

Strictly speaking at this point, the lexicalisation of *a*P as *old* must override the lexicalisation of the $\sqrt{}$ node (also *old*), which (due to the Faithfulness Restriction) requires a pointer that *old* lacks. At the same time, we are not literally overwriting one entry by another, since we want to insert at *a*P the very same entry that we inserted at the $\sqrt{}$ node. This must be legal, otherwise an entry such as (22) would never get to use its lexicalisation potential. In order to allow this, we augment the FR in the following way:

(23) *Faithfulness Restriction (FR)*
A lexicalisation α may override an earlier lexicalisation β iff

a. α contains a pointer to β
b. $\alpha = \beta$

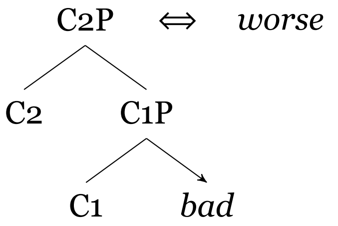
The clause (23b) now allows the entry (22) to keep overriding itself all the way to C1P. When C2 is merged, however, C2P cannot be spelled out by (22), and C2 is lexicalised by *-er*.

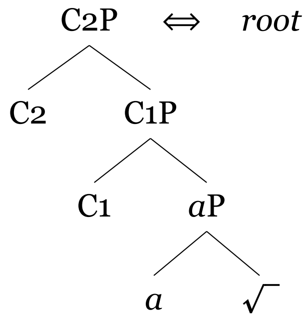
Finally, in order to capture the full spectrum of adjectival roots in English, we must introduce roots of two more sizes. To see that, consider again *a*P sized roots:

(24) [$_{aP}$ a $\sqrt{}$] $\Leftrightarrow$ *good, intelligent, ...*

The reason for claiming that these roots spell out the entire *a*P (as opposed to spelling out just the $\sqrt{}$) is the existence of morphologically complex positive-degree adjectives, like *slim-y, happ-y, cheek-y,* etc., where arguably, *-y* spells out little *a*. Since the *a*P-sized roots are not further decomposable, but distribute like positive degree adjectives, we treated them as spelling out the aP. But for the morphologically complex adjectives, where *-y* spells out the little *a*, we must specify the root only for $\sqrt{}$.

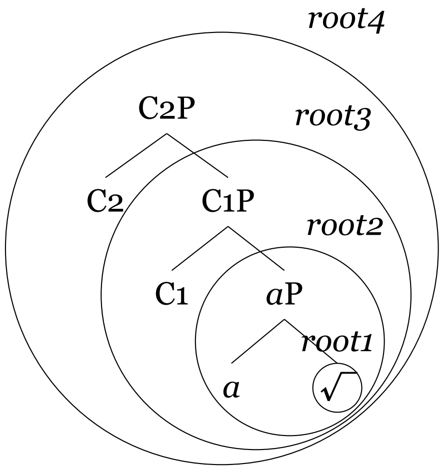
Another possible type of root is a root that spells out the whole C2P. This root spells out both C1 and C2, and hence it appears with no comparative marking whatsoever. Such roots come again (in principle) in two flavours. One type of such roots has a pointer to a different root, as in (25), and then the root works as a suppletive counterpart of a positive root. A case in point is the entry for *worse*, which contains a pointer to *bad*.

(25) 

(26) 

The other type is as in (26), without a pointer. English has no such adjectives, but we find cases like this in certain varieties of Czech, to be discussed in section 4.1 below.

In sum, the approach sketched in this section distinguished the √ (a syntactic node) from the morphological root, which spells out the √ node (or, equivalently, whatever is at the bottom of the functional sequence) and potentially other nodes. This allows for a variety of roots in the morphological sense, while still maintaining a single √ in syntax. The variety of roots that our theory makes available can be visualised as a set of concentric circles, encompassing various sizes of structure, as shown in (27):

(27) 

The various types of roots correspond with different types of morphological marking. A size 1 root (*root1* in (27)) appears with an overt little *a* in the positive, and the comparative marking comes on top of the little *a* (*happ-i-er*). A size 2 root (*root2*) has no overt marker corresponding to little *a*, and full comparative marking. A size 3 has no overt little *a*, and reduced comparative marking, while a size 4 root has no overt little *a* and no comparative marking

From the perspective of suppletion, we note that roots that reach up to the comparative zone (namely size 3 and 4) may work as suppletive comparatives of positive roots (those of size 2). The crucial theoretical possibility allowed by the split CMPR system is the existence of suppletive roots of size 3, corresponding to *bett-*, since these show the property of multiple exponence. Size 3 roots can both work as suppletive counterparts to positive-degree roots of size 2, and, at the same time, combine with an overt comparative marker, namely *-er*. This extends the reach of our theory to examples where suppletive roots combine with overt markers, i.e. cases of multiple exponence. Note, however, that the impression of multiple exponence is only apparent in our proposal, since the root and the ending expone different features, C1 and C2. It also follows from this analysis that in cases of multiple exponence, we will observe a certain type of 're-duction' of the relevant marker. In the following section, we present two case studies which further illustrate and refine the reduction effect under suppletion.

4 Empirical support

4.1 Czech

The first case study concerns the interaction between comparative marking and suppletion in Czech. We start from the fact that the traditional descriptions recognise three different allomorphs of the comparative (see Dokulil et al., 1986; Karlík, Nekula & Rusínova, 1995; Osolsobě, 2016). We give them on the first three rows of (28). Each row starts by the relevant allomorph, followed by the positive, comparative and the superlative. The final morpheme in each form is the agreement marker, which we ignore in extracting the comparative allomorph. Following this approach, the allomorph in (28c,d) is zero (no overt marker). We address the *k/č* alternation in (28c) shortly.

(28)

	allomorph	POS	CMPR	SPRL	GLOSS
a.	*ějš*	chab-ý	chab-**ějš**-í	nej-chab-**ějš**-í	'weak/poor'
b.	*š*	slab-ý	slab- **š**-í	nej-slab- **š**-í	'weak'
c.		hez-k-ý	hez-č- -í	nej-hez-č- -í	'pretty'
d.		ostr-ý	ostř -í	nej-ostř -í	'sharp'

On the first two lines, we illustrate the *ějš-í* and *-š-í* allomorphs with two adjectives that are semantically and phonologically similar. We do so to show that the allomorphy is not driven by phonology or semantics. Rather, the distribution is governed by arbitrary root class: *-ějš* is the productive allomorph, while *-š-í* is restricted (occurring with 72 out of 5440 adjectives sampled in Křivan, 2012).

On the third and fourth line, we illustrate the zero allomorph, and two facts should be noted. First of all, the positive and the comparative are not homophonous: their morphological identity is obscured by phonological interactions with the agreement markers. Specifically, the agreement marker *-í*, found in the comparative, triggers the palatalisation of the base (*k* goes to *č*), while the elsewhere agreement marker *-ý* does not palatalise the base (see Caha, De Clercq & Vanden Wyngaerd, 2019 for a discussion of the palatalisations). As a result, the forms are distinct. The second fact to be noted is that in the standard language, zero marking only occurs after a particular adjectival marker, namely *-k*. This morpheme is similar to the English *-y* in that it sometimes occurs after nominal roots (e.g., *sliz-k-ý* = 'slim-y') and sometimes after cranberry type of morphemes (e.g., *hez-k-ý* = 'prett-y'). Because of its limited distribution, it is not clear whether the ø allomorph needs to be recognised as a separate marker, or perhaps dismissed as a special realisation of *-š* after *-k*. We do, however, recognise the zero as a relevant allomorph to consider, because in the dialects of North Eastern Bohemia (Bachmannová, 2007), one finds it also after nonderived adjectives, as shown on the last row (28d). We note, however, that much of our reasoning is valid even if it turns out that the zero allomorph is an effect of phonology, rather than morphology.

Taking the traditional descriptions at face value, an interesting generalisation is that going from the first to the third line, in (28), we see an increasingly 'reduced' realisation of the full marker *-ějš-*. (28b) suggests that *-š* is a substring of *-ějš*. This makes it tempting to decompose *-ějš* into two morphemes, *-ěj* and *-š*, as suggested by Caha, De Clercq, and Vanden Wyngaerd (2019).

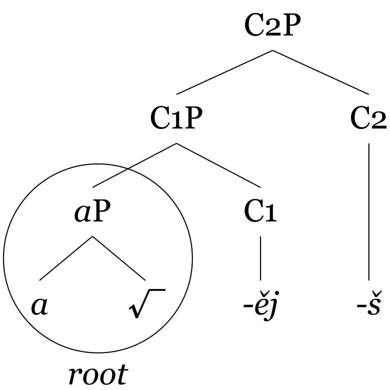
Independent evidence for decomposing *-ěj-š* comes from comparative adverbs, seen in the second column of (29). Here the *-š*-part of the comparative adjective is systematically missing, while *-ěj* is preserved. This confirms that *-ěj* and *-š* are independent morphemes.

(29)

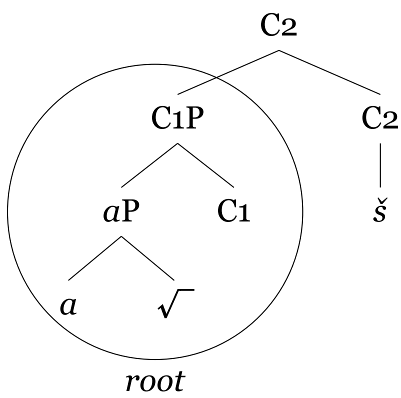
CMPR ADJ	CMPR ADV	
chab-ěj-š-í	chab-ěj-i	'weak'
rychl-ej-š-í	rychl-ej-i	'fast'
červen-ěj-š-í	červen-ěj-i	'red'

Given our model with two comparative heads, the facts are easily captured if *-ěj* and *-š* spell out C1 and C2 respectively. With *a*P-sized roots, both markers surface, see (30). With roots of the size C1P, only *-š* appears, as in (31).

(30)



(31)



Zero marking arises when the root spells out all of the projections, as in (26) above. Recall that (26) was presented as a logical option allowed by our system, and though it was not attested in English, we need it to account for *ostr-ý* 'sharp' in (28). This concludes our discussion of 'regular' comparatives, i.e., those based on the same base as found in the positive, and we now turn to suppletive comparatives.

Given our theory of suppletion where suppletive roots override the base, comparative suppletion requires a root that spells out a different node than the positive. Since the positive spells out *a*P, a suppletive comparative root must be at least of the size C1P. This idea interacts with our account of comparative allomorphy. Specifically, since roots of the size C1P cannot combine with *-ěj-š* (recall (31)), we now predict that suppletive roots should be incompatible with *-ěj-š*. To verify this, the table (32) presents an exhaustive list of suppletive adjectives based on Dokulil et al. (1986, p. 379) and Osolsobě (2016). The table shows that the prediction is borne out: all suppletive adjectives require the 'reduced' *-š* allomorph.[12]

(32)

POS	CMPR	GLOSS	POS	CMPR	GLOSS
dobr-ý	lep-š-í	'good'	špatn-ý	hor-š-í	'bad'
velk-ý	vět-š-í	'big'	mal-ý	men-š-í	'little, small'
dlouh-ý	del-š-í	'long'			

We submit these facts here as an important confirmation of the current model, which predicts that when there are two or more ways of marking the comparative, suppletion is incompatible with the full marker. With reduced markers, we find both suppletive and regular cases, depending on whether the entry of the size C1P has a pointer or not.

It is thanks to phrasal lexicalisation, the mechanism of pointers, and the post-syntactic lexicon that the single $\sqrt{\ }$ approach can be maintained against the surface diversity of morphological roots. Roots can be stored in the lexicon without functional structure, with (more or less) functional structure, and with or without a pointer, resulting in the different types of roots that we observe. Crucially, suppletive forms can be linked to their base form without the need to code the identity of the base on the syntactic $\sqrt{\ }$ node.

4.2 Latin

Latin provides further evidence for the correlation between reduced marking and suppletion predicted by our theory, but in contrast to Czech, it shows the effect in the superlative. The regular marking of comparative and superlative is shown in (33a).

(33)

	POS	CMPR	SPRL	GLOSS	marking in SPRL
a.	alt-us	alt-i-or	alt-**i-ss-im**-us	'tall'	full marking
b.	mal-us	pe- or	pe- **ss-im**-us	'bad'	SPRL lacks *-i*
c.	bon-us	mel-i-or	opt- **im**-us	'good'	SPRL lacks *-i-ss*
d.	magn-us	ma-i-or	max- **im**-us	'big'	SPRL lacks *-i-ss*
e.	parv-us	min- or	min- **im**-us	'small'	SPRL lacks *-i-ss*
f.	mult-us	plūs	plūr- **im**-us	'much'	SPRL lacks *-i-ss*

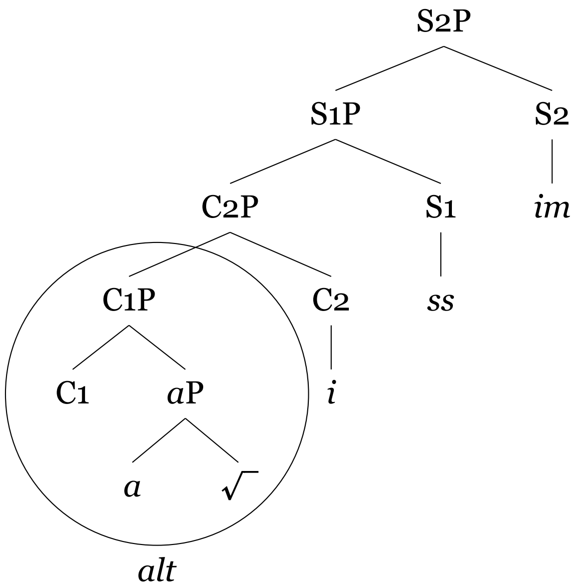
[12] See Caha, De Clercq, and Vanden Wyngaerd (2019) for the discussion of potential counterexamples.

We segment the regular superlative into five morphemes (following De Clercq & Vanden Wyngaerd, 2017). The first morpheme is the root (*alt*), and the last one (*-us*) an agreement marker. The reason for treating the three middle markers *-i*, *-ss* and *-im* as separate morphemes is that they can be missing in the irregular forms shown in (33b-f). These represent an exhaustive list of the suppletive cases given by Gildersleeve and Lodge (1903, p. 46).

We analyse *-i* (the first of the post-root superlative morphemes) as a comparative marker, i.e., as a morpheme identical to the *-i* of the comparative *alt-i-or*. We treat *-i* in the same way as the English *-er*, namely as the lexicalisation of C2. Consequently, we analyse *-or*, which follows *-i* in the comparative, as an agreement marker. We do so because the masculine form *alt-i-or* 'taller, M.SG' alternates with the neuter *alt-i-us*. As a C2 marker, *-i* is compatible with suppletion. In (33c), for instance, the positive degree root *bon-* realises *a*P, the suppletive comparative root *mel-* realises C1P, and *-i-* is the marker of C2.

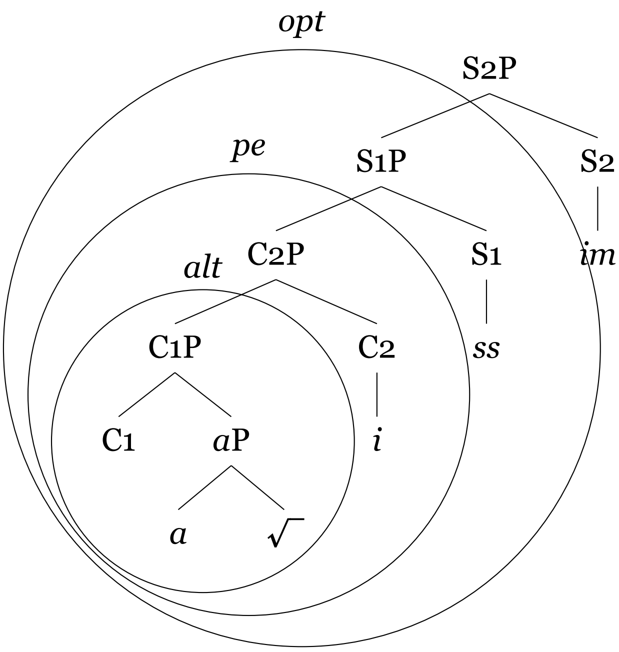
The remaining two morphemes mark the superlative, which we split into S1 and S2, analogously to CMPR. The structure of *alt-i-ss-im(-us)* thus looks as follows:

(34)



Against this background, consider the fact that the superlative marking with suppletive roots is *always* reduced, see (33b-f). There is not a single suppletive root in Latin which keeps all the three pieces in place, as indicated in the final column of (33). Specifically, we see two classes of suppletive roots. The majority of suppletive roots lacks the C2 *-i* as well as the S1 *-ss*, and we would thus analyse them as spelling out S1P. However, *pe-* lacks only the *-i*, which, on the assumption that *-i* is C2, leads to the proposal in (35).

(35)



This picture has implications for the analysis of the comparative. Specifically, all suppletive roots which spell out a projection larger than C1P should make *-i* disappear not only in the superlative, but also in the comparative. This is true for the adjectives *min-or* 'smaller' and *plus* 'more', as well as, arguably, *pe-or* 'worse,' where the glide in the comparative *pe[j]or* results, on our analysis, from phonological factors (hiatus filling). Note that *plus* lacks the agreement marker *-or*, and Gildersleeve and Lodge (1903, p. 46) analyse it as a neuter form, with the masculine cell left blank. Here we treat *plus* as spelling out minimally S1P, lacking *-i* in the comparative, and in the superlative also *-ss*. We leave the reasons for the lack of agreement in the comparative open to interpretation.[13]

The (c) and (d) cases of (33) warrant some further comment, since they have *-i-* in the comparative but lack it in the superlative. This is because they instantiate an ABC-pattern, with two different suppletive roots: one of size C1P (explaining the presence of *-i-* in the comparative), and another of size S1P (explaining the absence of both *-i-* and *-ss-* in the superlative). These suppletive roots successively point to one another, e.g. the lexical entry for *opt-* contains a pointer to *mel-*, which itself contains a pointer to *bon-*.[14]

[13] Note that *plus* and *plur* are two shapes of a single root, with *s* undergoing rhotacism in intervocalic positions, which happens also in the comparative when inflected, cf. *plur-is* 'more, GEN.SG.'

[14] We take *s* in the superlative *maks-im-us* 'biggest' to be a part of the root, given that it is not a geminate like the superlative S1 marker. The comparative *ma-i-or* 'bigger' could arise from the root *mag-*, as suggested in Bobaljik (2012), with the root final *g* first assimilating to *j* (yielding *maj-j-or*), which is then reduced due to degemination. Bobaljik (2012) concludes from this that this adjective has a regular AAA pattern, and hence, that it is irrelevant for suppletion. However, this move requires the parsing of the positive as *mag-nus*, which we see little evidence for. We therefore treat this as an ABC pattern (*magn–ma(g)–maks*).

Related to this we note that the literature sometimes makes a distinction between weak or mild suppletion, where the related forms are phonologically similar (e.g. *sing-sang*), and strong suppletion, In sum, this case study also illustrates how $\sqrt{\ }$ and roots should be treated differently. Whilst there is only one $\sqrt{\ }$ in syntax, there are many different types of roots in the lexicon, which store $\sqrt{\ }$ with (or without) other pieces of structure. The trade-off between the size of roots and the superlative degree morphology in Latin shows that suppletion follows from the size of lexical entries of morphological roots and not from the nature of the syntactic $\sqrt{\ }$.

5 Non-local allomorphy

In this section, we turn to a case of suppletion in Korean discussed by Chung (2009). Choi and Harley (2019) have argued that this represents a case where allomorphy may be conditioned nonlocally, possibly skipping intervening morphemes. The relevant situation of nonlocal allomorphy is abstractly depicted in (36).

(36) a. $\sqrt{153(A)}$-AFF1
b. $\boldsymbol{\sqrt{153(B)}}$-AFF1-**AFF2**

What the formulas in (36) depict is that insertion at the root $\sqrt{153}$ is suppletive and varies between A ($\sqrt{153(A)}$) and B ($\sqrt{153(B)}$). The suppletion is conditioned by the presence/absence of AFF2. The trigger is nonlocal because it is separated from the root by an intervening affix, as (36b) shows.

Choi and Harley (2019) operate in a framework where lexical insertion happens under terminal nodes only, and suppletion is a case of contextual allomorphy, as illustrated in (3) above. Therefore, they capture the facts by saying that the $\sqrt{153}$ is realised as B if somewhere higher up in the structure the triggering feature [F] is found. [F] is then independently realised by AFF2.

For our analysis, such cases represent a challenge. The reason is that in order not to discriminate among roots in syntax, our system relies on pointers and overriding, thereby eliminating the possibility of standard rules of contextual allomorphy, which make reference to a wider context. In our system, the 'trigger' for allomorphy needs to be strictly local, in the sense of 'having to be a part of the set of features exponed by the suppletive root.' A situation like the one depicted in (36), where the presence of a suppletive root is apparently caused by a higher head across an intervening affix therefore cannot arise in our system.

What we want to do in this section is illustrate the viability of an approach to apparent non-local cases that goes along the following lines: what appears to be nonlocal is

where such similarity is absent, as in the pair *bad-worse* (see e.g. Pomino & Remberger (2019), and references cited there). The former type is often treated as morphologically regular, and subject to post-morphology phonological readjustment in DM (see Bobaljik, 2017). We make no difference in the treatment of cases of weak or strong suppletion, in that we take both weakly and strongly suppletive allomorphs to be lexically stored in terms of an entry containing a pointer. We thus do not rely on phonological readjustment rules (see Harley & Siddiqi, 2013 for the same approach).

only so under certain assumptions about the structure, but if we enrich the structure, what looked like a case of nonlocal allomorphy starts looking like local allomorphy, in the sense of the previous paragraph. We will argue that nonlocal conditioning of allomorphy is both unnecessary and undesirable. It is unnecessary once we enrich the structure involved in negation and honorification in Korean. It is also undesirable because it predicts the wrong results once the interaction between negation, causation, and honorification is taken into account.

In addition, the Korean data that we shall discuss in this section also present a case of double exponence in the domain of honorific marking. We shall propose to deal with this case of double exponence by analogy with the one of the English comparative form *bett-er*, i.e. by means of, on the one hand, an enrichment of the functional hierarchy with an additional head, and the principle of phrasal lexicalisation on the other.

5.1 A Korean paradox

Korean shows a paradox with respect to the conditioning of allomorphy in the domain of negation and honorification, which was first discussed by Chung (2009), and then taken up again by Choi and Harley (2019). The paradox is summarised in the table in (37).

(37)

	regular pattern	$\sqrt{\text{EXIST}}$	$\sqrt{\text{KNOW}}$
a.	$\sqrt{\text{X}}$	**iss**	**al**
b.	NEG $\sqrt{\text{X}}$	**eps**	**molu**
c.	$\sqrt{\text{X}}$ HON	**kyey**-si	**al**-si
d.	NEG $\sqrt{\text{X}}$ HON	ani/mos **kyey**-si	**molu**-si

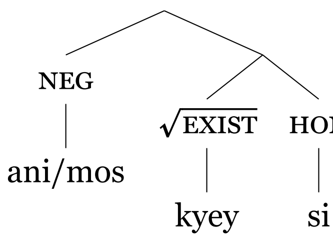
The first column of (37) abstractly shows the regular way of forming honorific and negative forms by affixes. The regular markers of negation and honorification occur each on a different side of the root, so that it is not *a priori* obvious what their hierarchical relation is with respect to the root. Their hierarchy could be, however, inferred indirectly by looking at suppletive forms, which are given in the last two columns of the table.

The general form of the paradox is this. Assuming (as we do) that suppletion is always local, the hierarchy of negation and honorification could be determined by looking specifically at the cell where both are present. This is the last row of the table (37). But the facts from suppletion point either way, paradoxically: one verb ($\sqrt{\text{EXIST}}$) suggests that the honorific head is closer to the root, because the root shows the 'honorific' allomorph where both triggers are available (as indicated by the shading). On the other hand, the verb $\sqrt{\text{KNOW}}$ suggests that negation is closer to the root, because it has a suppletive negative form even in the presence of an overt honorific suffix. Let us now look at the patterns in more detail.

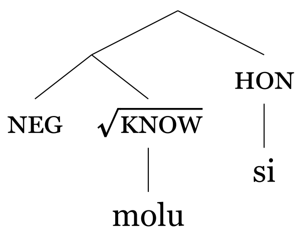
The first verb, *iss* ‘exist’, has a negative suppletive form *eps* ‘not exist’ (37b), which is a portmanteau expressing negation (Chung, 2009).[15] It also has a suppletive honorific form *kyey-si* (37c). When negation and honorification co-occur, as in (37d), *kyey-si* is used, suggesting that honorification takes precedence over negation in determining the allomorph of the root (*ani* and *mos* ‘not’ are analytic negative markers). Assuming that this precedence is a function of greater structural closeness, this suggests the functional hierarchy in (38a), represented treewise in (39a). The second verb in (37) is *al* ‘know’, which also has a suppletive negative form, the portmanteau *molu* ‘not know’ (37b). There is no allomorph in the presence of honorification, and the regular honorific marker *(u)si* is expressed on the verb (37c). When honorification and negation co-occur, as in (37d), *molu* appears again, suggesting that negation takes precedence over honorification in determining root allomorphy. In terms of structural closeness to the root, this suggests the opposite conclusion from the one reached earlier, namely (38b)/(39b).

(38) a. NEG > HON > $\sqrt{\text{EXIST}}$
b. HON > NEG > $\sqrt{\text{KNOW}}$

(39) a.



b.



The paradox exists in virtue of the following two assumptions:

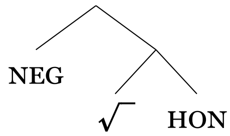
(i) there is only a single functional hierarchy (for Korean), i.e. (38a) and (38b) cannot both be correct
(ii) allomorphy is conditioned strictly locally (see Bobaljik, 2012; Moskal (2013); Moskal & Merchant, 2015, and many others).

The first of these assumptions is uncontroversial. Opinions diverge, however, as to which of the two hierarchies shown in (39) is the correct one. Choi and Harley (2019)

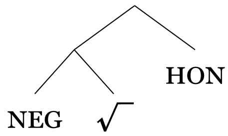
[15] *iss-* has three meanings (Martin, 1992, p. 319), one of which is ‘exist’, another is ‘stay intentionally’, and a third meaning is ‘have’. The negation of *iss-* ‘stay’ is *an(i) iss* (Chung, 2009, p. 539; Chung, 2007, p. 124–127), while the negation of *iss-* ‘exist’ and ‘have’ is *eps*. Chung (2007) argues convincingly that *iss-* ‘exist’ is adjectival, while *iss-* ‘stay’ is verbal, showing additional functional morphology on the root in the present tense. We hypothesize that the absence of negative suppletion with *iss-* ‘stay’ follows from intervening structure between *ani* and the root *iss-* ‘stay’, violating locality. However, we focus on *iss-* ‘exist’ in this paper, deferring a detailed account of how the different readings for *iss-* arise to future research.

assume that the functional hierarchy illustrated in (40a) is the correct one, whereas Chung (2009) argues in favour of (40b):[16]

(40) a.



b.

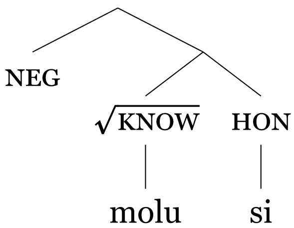


Regardless of which of these two options is taken, it seems clear that a strict version of (ii) cannot be maintained. In the next section, we discuss the proposal by Choi and Harley (2019) which abandons (ii), and some of the problems that it faces.

5.2 Non-local allomorphy and causative intervention

We start out by taking a closer look at the specifics of the account by Choi and Harley (2019). Recall first that they adopt the structure in (40a), where the HON head is local to the root. This takes care of the allomorphy on *iss-* 'be' in a straightforward and local fashion, the HON head taking precedence over negation when both are present. In order to account for the pattern of suppletion found with *al* 'to know', Choi and Harley (2019) argue that if no suppletive form has been inserted locally, root allomorphy can be conditioned from a distance, as long as the conditioning head is within the complex X° head (Bobaljik, 2012). This condition is satisfied for √KNOW, where no suppletive VI exists that is conditioned by HON, so that NEG can condition allomorphy of the root across HON. This is shown in (41), where the suppletive portmanteau *molu* 'not know' is inserted under the root terminal, conditioned by a NEG head separated from it by an intervening HON head. This account cannot be replicated under constituent lexicalisation.

(41)



In what follows we shall discuss two cases (not discussed by Choi & Harley, 2019) that are structurally analogous to (41), but that show different behaviour, in that a

[16] Choi and Harley's (2019) hierarchy is not (only) the consequence of an assumption they make about the functional sequence. Instead, it results from their assumption that honorification is a form of agreement with an honorific subject, which is realised on *v* as a result of a rule of HON-sprouting that applies in the morphological component if a specific configuration is realised, i.e. if the the verb is c-commanded by an NP with [+hon] (cf. Marantz, 1991, 1993). The result of this node sprouting rule makes HON lower in the structure than NEG. See Kim and Sells (2007) for arguments to the effect that Korean honorific marking is not to be considered as agreement.

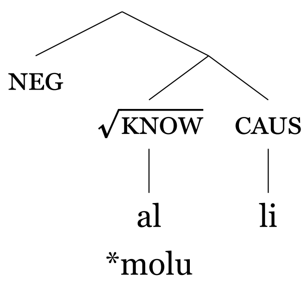
higher head is not able to trigger suppletion of the root across an intervening head. We shall refer to these two cases as instances of ‘causative intervention’, as they involve the intervention of a CAUS head between the root and a higher functional head (HON or NEG). This intervening causative head appears to block the suppletive realisation of the root, unlike what happens in (41). The facts of causative intervention suggest to us that suppletion has to be strictly local after all, since the presence of a causative intervener appears to block it. We shall then proceed to develop an alternative account for the case of (41) in section 5.3.

The first case of causative intervention involves negation. Again taking the verb *al* ‘know’, we see the following pattern (Chung, 2007):

(42)	a.	$\sqrt{\text{KNOW}}$	**al**	‘know’
	b.	NEG $\sqrt{\text{KNOW}}$	**molu**	‘not know’
	c.	$\sqrt{\text{KNOW}}$ CAUS	**al**-li	‘let know, inform’
	d.	NEG $\sqrt{\text{KNOW}}$ CAUS	ani/mos **al**-li	‘not inform’

The case is similar to the one in (37), with negation occurring to the left of the verb and the other marker (honorific or causative) to its right, thus yielding a potential ambiguity as to the hierarchical relations. However, in this case the relative scope of the negation and causative marker can be deduced from the meaning. Specifically, in (42d), the meaning is ‘not inform’ (‘not let know’) rather than ‘cause to not know,’ suggesting a scopal hierarchy NEG > CAUS > $\sqrt{\text{KNOW}}$. Given that hierarchy, the structure of (42d) looks as in (43), which is exactly as in (41), modulo the substitution of CAUS for HON. Yet in this case, the NEG head is apparently unable to trigger the insertion of the suppletive negative portmanteau *molu* across the intervening CAUS head, since only the nonsuppletive root *al* ‘know’ is possible.

(43)



This is unexpected under Choi and Harley’s (2019) proposal.

The second case of causative intervention in Korean involves honorific suppletion, which is found with a small number of Korean verbs, given in (44) (Kim & Sells, 2007, p. 312).[17]

[17] The regular *iss-usi-ta* means ‘have’, while the suppletive *kyey-si-ta* means ‘be/exist’ or ‘stay’ (Martin, 1992, p. 217). As already mentioned in footnote 15, this paper focuses on *iss-* ‘exist’ and the morphological patterns it triggers, and leaves the other readings and its associated morphological patterns out

(44)

		ROOT-DECL	ROOT-HON-DECL	ROOT-HON-DECL	
	a.	mek-ta	*mek-usi-ta	caps-usi-ta	‘eat’
	b.	ca-ta	*ca-si-ta	cwum-usi-ta	‘sleep’
	c.	iss-ta	iss-usi-ta	kyey-si-ta	‘be, exist, have’

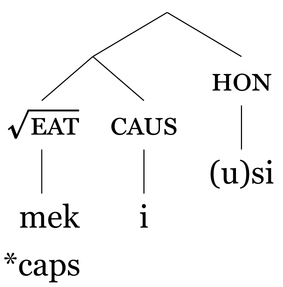
These show the following pattern in the interaction with causation:[18]

(45)

	a.	$\sqrt{\text{EAT}}$	**mek**	‘eat’
	b.	$\sqrt{\text{EAT}}$ CAUS	**mek**-i	‘let eat’
	c.	$\sqrt{\text{EAT}}$ HON	**caps**-usi	‘eat’
	d.	$\sqrt{\text{EAT}}$ CAUS HON	**mek**-i-si	‘let eat’

Since the causative and the honorific markers are on the same side of the root, it is easy to see their hierarchy, which we take to be the mirror image of the linear order, i.e. HON > CAUS > $\sqrt{\ }$.[19] This translates into the following tree structure:

(46)



We see the same pattern as in (43) above: HON is not able to trigger the insertion of the suppletive honorific form *caps* ‘eat’ under the root node across an intervening CAUS head. This is a second case, then, that is unexpected under the approach of Choi and Harley (2019). In these two cases of causative intervention’, a CAUS head intervenes between the root and a higher functional head (HON or NEG), and blocks the suppletive realisation of the root. We take the data of causative intervention to cast serious doubt on Choi and Harley’s (2019) claim that triggers for suppletion can be nonlocal.[20]

5.3 Towards an alternative: decomposing HON

In the light of the preceding discussion, we shall now proceed to develop an alternative analysis of the Korean paradox in terms of phrasal lexicalisation and the strictly local allomorphy requirement that this approach entails. The fundamental ingredient of our

of consideration.

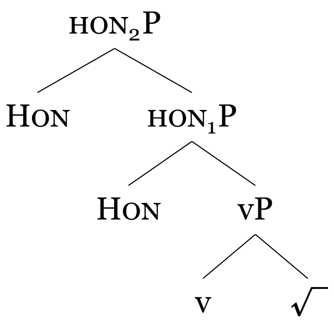
[18] The verb *iss* ‘be, exist’ does not permit causation, so that the interaction of honorification with causation cannot be illustrated for this verb.

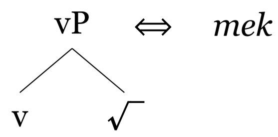
[19] The alternation between -*usi*- and -*si*- is phonologically conditioned: -*u*- is an epenthetic vowel that appears between two heteromorphemic consonants (Chung, 2009, p. 543).

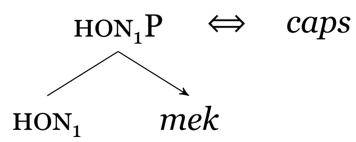
[20] A possible way out for Choi and Harley (2019) to account for this problem would be to argue that CAUS is a cyclic node, which blocks suppletion. It will be clear that such arbitrary marking of heads as interveners, while deriving the facts, seriously undermines the conceptual appeal of the proposal.

alternative is the idea that honorification (like comparative/superlative formation) involves two HON heads. In this section, we explain how assuming two heads yields the relevant honorific forms. In Section 5.4 we add the causative head, and show how it interacts with honorification. In Section 5.5, we pinpoint the NEG head in a particular syntactic position and show how it interacts with causative formation. Finally, with all the ingredients in place, Section 5.6 explains how the two HON heads allow us to resolve the Korean paradox noted in Choi and Harley (2019).

In order to see why assuming two honorific heads is needed, consider the example of the honorific suppletive form *caps-usi* 'eat-HON'. On the one hand, the root has a special honorific shape (the non-honorific shape of the root is *mek* 'eat'); on the other hand, the root is accompanied by an overt honorific marker *-usi* 'HON.' Therefore, just like in the case of *bett-er*, we hypothesise that two honorification-related heads are involved, as in (47). For the lack of a better term, we call them HON$_1$ and HON$_2$. The verbal structure these heads come on top of is abbreviated as [v $\sqrt{\ }$] in (47).

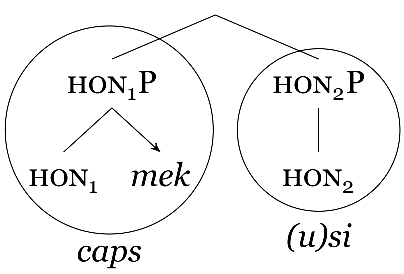
(47)


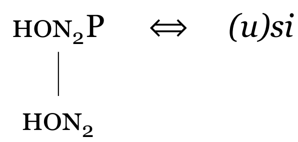
(48)


(49)


In this setting, the co-occurrence of a suppletive root and an overt honorific suffix is easily captured. Specifically, we associate the string *mek* 'eat' with a constituent of the size vP, as in (48), while *caps* 'eat.HON' is a realisation of HON$_1$P plus whatever features are contained in the verb *mek* 'eat'. The lexical entry of *caps* 'eat.HON' therefore looks as in (49); it basically says that *caps* is the honorific form of *mek* 'eat.'

The structure of the full honorific form *caps-usi* is then as given in (50). We can see that the honorific root *caps* 'eat.HON' applies at HON$_1$P, overriding the nonsuppletive *mek* 'eat' in the process. The structure further presupposes that the constituent spelled out by *caps* 'eat.HON' moves out of HON$_2$P, and the honorific marker is inserted as the spellout of the remnant HON$_2$P. The lexical entry for the honorific *-(u)si* is as in (51).

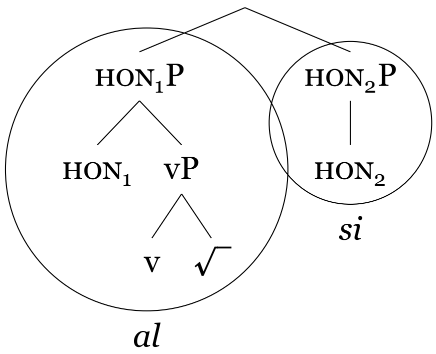
(50)


(51)


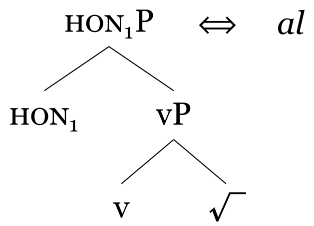
The reader will notice that this account follows the same logic as developed for *bett-er* in Section 3 (*bett-* spells out C1P, *-er* spells out C2).)

Moving further along the same path, non-suppletive honorifics will be captured in the same way as English non-suppletive forms like *smart-er*. Recall that a root like *smart* spells out the whole C1P (like *bett*), but it lacks a pointer. Quite parallel to this treatment, we are assuming that Korean non-suppletive roots spell out the whole HON$_1$P, as shown in (52). This structure shows the honorific form of the (non-suppletive) verb *al* 'to know.'

(52)



(53)



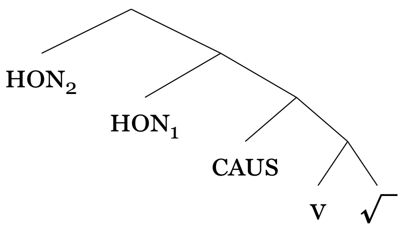
This leads us to posit for *al* 'know' a lexical entry like the one in (53). Because of the Superset Principle, this makes the verb also usable in non-honorific environments, spelling out just the vP. The ambiguity of non-suppletive roots (spelling out either vP or HON$_1$P) will be important later on.

5.4 Adding causatives

This section introduces the causative head CAUS in the structure. It starts by providing a structure for regular verbs, and then turns to suppletive verbs.

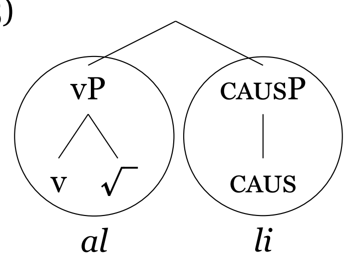
To begin with, we shall place the CAUS head in the tree relative to HON$_1$ and HON$_2$. The empirical facts to be discussed suggest that CAUS is below HON$_1$. The relevant hierarchy is shown in (54).

(54)

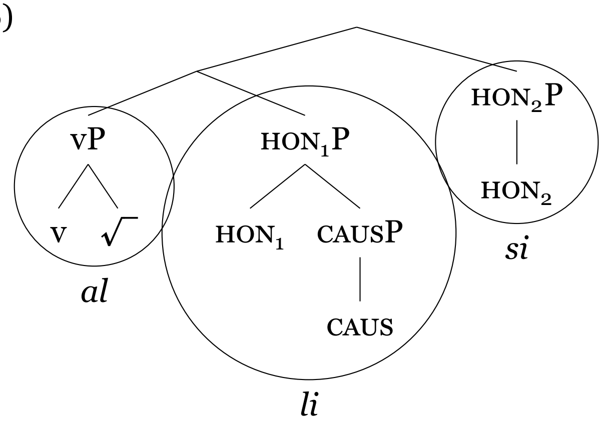


How does the presence of CAUS influence the derivation? The main consequence is that regular verb roots with an entry like (53) (spelling out √, v and HON$_1$) will only be able to spell out √ and v, since CAUS makes it impossible for such a root to also spell out HON$_1$. As is obvious from (54), CAUS intervenes. The root will therefore spell out just the vP and move to the left; after the movement, the causative suffix *-li* spells out CAUS, as in (55). We are using the root *al* 'to know', whose entry is in (53).

(55)



(56)



The tree in (55) represents the structure of the non-honorific causative. The honorific causative is derived by adding HON_1 and HON_2 on top of the non-honorific causative. On the surface, this leads to the addition of *(u)si* to the causative, yielding *al-li-si* 'to let know, honorific.'

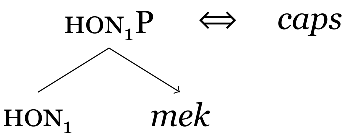
Let us next address the question of what happens to HON_1 in the honorific causative. We know that it is not spelled out by *(u)si*, which can realise only HON_2. Since the root cannot spell out HON_1 either (since CAUS intervenes), we conclude that HON_1 is spelled out along with the causative *li*. The full structure we are assuming is therefore as in (56). Note that the causative *li* spells out different structures in (55) and (56) and alternates (in a manner reminiscent of regular roots) between a non-honorific use in (55) and an honorific use in (56). In particular, its lexical entry is specified as containing both HON_1 and CAUS, which allows it to spell out either both of these features, or just CAUS.

The interest of this derivation is that it allows us to explain why causativisation blocks honorific suppletion. The relevant facts are as repeated in (57) (originally (45)), and the relevant observation is that the honorific causative in (57d) uses the non-honorific root.

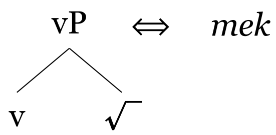
(57)
a. $\sqrt{\text{EAT}}$ **mek** 'eat'
b. $\sqrt{\text{EAT}}$ CAUS **mek**-i 'let eat'
c. $\sqrt{\text{EAT}}$ HON **caps**-usi 'eat'
d. $\sqrt{\text{EAT}}$ CAUS HON **mek**-i-si 'let eat'

This pattern can be captured by using the entries for 'eat' as proposed in (48) and (49) above. We repeat them in (58) and (59).

(58)

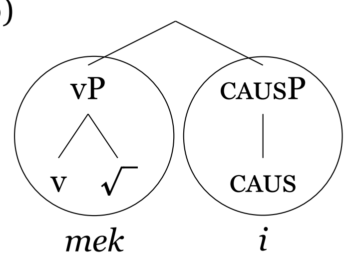


(59)

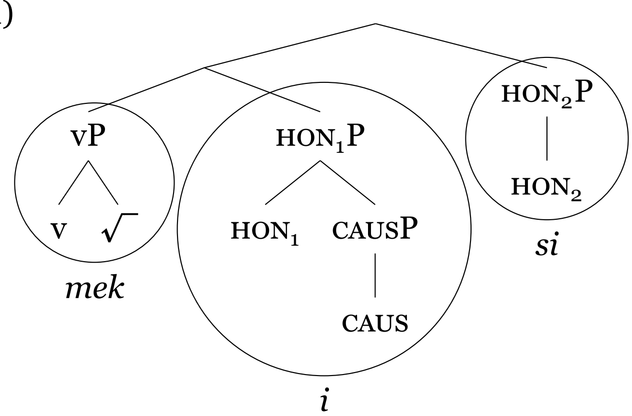


With these lexical entries, both types of causatives (i.e., both the honorific and the non-honorific causative) are correctly expected to be based on the nonsuppletive root *mek* 'eat.' To show that, we give in (60) and (61) the stuctures for the non-honorific and the honorific causative respectively. These structures are the same as those in (55) and (56), only the root is different ('eat').

(60)



(61)



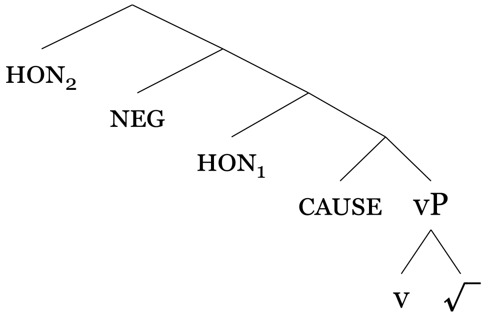
The most relevant thing to look at is the honorific causative in (61). In this structure, the HON_1 head is separated from the vP by the CAUS head. Therefore, just like with regular verbs, HON_1 cannot be spelled out by *caps* 'eat.HON.' This explains why the root only spells out vP and surfaces as *mek* in the honorific causative.

5.5 Adding negation

This section puts forth a proposal for negative suppletion. We also propose a specific position for the NEG in the tree, paving the way for the solution to the paradoxical interaction between negation and honorification.

Let us begin by proposing a particular position for negation in the tree. Recall first that the existing literature contains diverging opinions on the position of NEG. Some authors place it higher than HON (Choi & Harley, 2019), others place it lower than HON (Chung, 2009). Our account with split HON allows us to take the good aspects of each of these proposals by placing the NEG head in between the two honorific heads. The full structure we shall be assuming is therefore as in (62).

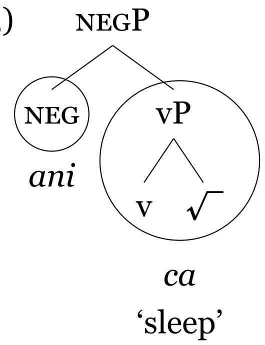
(62)



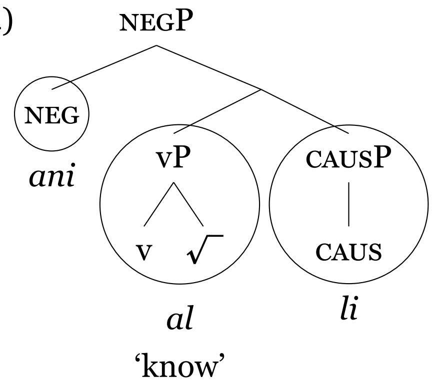
All the heads above vP are assumed to be optional in the sense that they can be either present or absent. The only caveat applies to the two HON heads, which are either both present, or both absent.

As a default, the NEG head is spelled out by one of the two negative markers *ani* or *mos*. The tree (63) shows the negation of a simple verb root *ca* 'sleep.' The tree in (64) shows the negation of a causative.

(63)



(64)

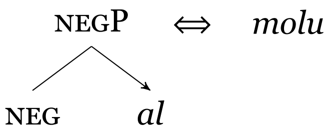


Let us now turn to the verb *al* 'know', which has a negative suppletive form *molu*. The pattern of this verb is repeated in (65) (repeated from (42)). The most remarkable datapoint is on line (d), showing that the causative blocks the use of *molu-* despite the presence of NEG in the structure, and leading to an analytic marking of negation as *ani* or *mos*.

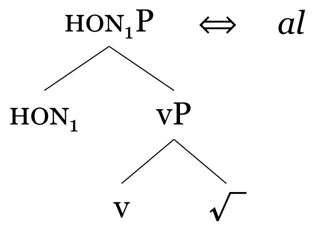
(65)	a.	$\sqrt{\text{KNOW}}$	**al**	'know'
	b.	NEG $\sqrt{\text{KNOW}}$	**molu**	'not know'
	c.	$\sqrt{\text{KNOW}}$ CAUS	**al**-li	'let know, inform'
	d.	NEG $\sqrt{\text{KNOW}}$ CAUS	ani/mos **al**-li	'not inform'

To see how our system accounts for this, let us first provide the lexical entry for the suppletive negative form *molu* 'not know,' see (66). The entry contains a pointer to the non-negative verb *al* 'know.' That is, it realises the NEG head and whatever features are realised by *al* 'know.' The entry of *al* is repeated in (67) (recall (53)).

(66)



(67)



Our account correctly predicts that the lexical item in (66) cannot be used in the causative structure as the spellout of NEG and the root *al*. The reason is that CAUS intervenes between NEG and the root. Instead, the vP, the CAUS head, and NEG have to be each spelled out by a distinct morpheme; the relevant structure is shown in (64) above. It correctly predicts that even though NEG is present in the structure of the negated causative, the suppletive negative form *molu* 'not know' cannot not used.

In sum, the CAUS head is closest to the root. Like all the other functional heads in the above sequence, it is an optional element. When present, it triggers 'causative intervention' both for suppletive negative verbs (as discussed in this section) and suppletive honorific verbs (as discussed in the previous section). The reason for this is the the presence of CAUS blocks the lexicalisation of the the bottom-most vP along with HON_1 or NEG.

5.6 Explaining the paradox

So far, we discussed the interaction between causativisation and negation, and between causativisation and honorification. What we still have not discussed is the interaction between negation and honorification, which is precisely the domain where the paradox discussed in section 5.1 arises. For convenience, we repeat the relevant data here.

(37)

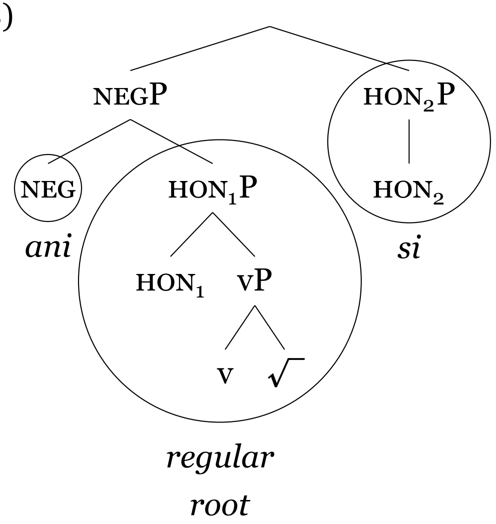
	regular pattern	$\sqrt{\text{EXIST}}$	$\sqrt{\text{KNOW}}$
a.	$\sqrt{\text{X}}$	**iss**	**al**
b.	NEG $\sqrt{\text{X}}$	**eps**	**molu**
c.	$\sqrt{\text{X}}$ HON	**kyey**-si	**al**-si
d.	NEG $\sqrt{\text{X}}$ HON	ani/mos **kyey**-si	**molu**-si

The paradox is that with the root $\sqrt{\text{EXIST}}$, the presence of the honorific blocks negative suppletion, as shown on line (d). This suggests that HON is closer to the root than NEG. With $\sqrt{\text{KNOW}}$, the honorific does not block negative suppletion, suggesting NEG is closer to the root.

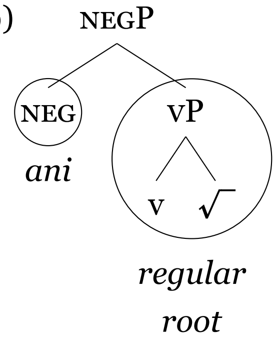
The point of this section is to show that with the two HON heads in the structure, this paradox can be resolved. We first focus on deriving the regular pattern as given in the first column on the left. Recall that for such regular roots, we assume that they spell out HON_1P.

As a starting point, let us draw the structures for a negated honorific and a negated non-honorific. The relevant structures are then as given in (68) (negated honorific) and (69) (negated non-honorific).

(68)



(69)

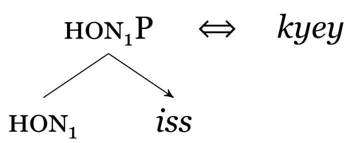


What do these structures predict for the negative suppletive form *molu* 'not know'? Recall that the lexical entry for *molu*, given in (66) above, contains NEG and a pointer to *al*. First of all, they predict that *molu-* will be able to spell out the whole structure (69), provided vP is lexicalised by *al*.

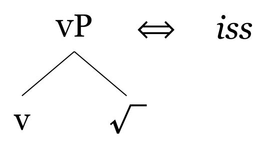
The structures further predict that honorification will not block negative suppletion for *al* 'know.' The reason is that the root *al-* 'know' is associated to a constituent of the size HON1P, recall (67) above. Therefore, *al* can spell out either the HON$_1$P in (68), or just the vP in (69). Since *molu* 'not know' has a pointer to *al*, it will apply always when the NEGP contains NEG and *al*, regardless of the size of the structure spelled out by *al*. Therefore, whenever a NEG head is merged to a constituent that has been spelled out as *al* on the previous cycle, *molu* is going to be inserted. Therefore, we correctly predict that we find *molu* both in (68) and (69). The consequence is that with *molu* 'not know,' honorification does **not** block negative suppletion.

Next we turn to the verb *iss* 'be, exist.' This verb has three different suppletive allomorphs. It has a suppletive honorific form *kyey*, which spells out HON$_1$P and contains a pointer to *iss*, see (70). The non-honorific form *iss* then spells out just vP, see (71).

(70)

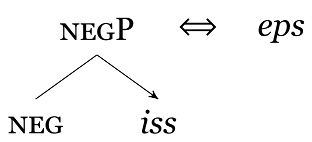


(71)



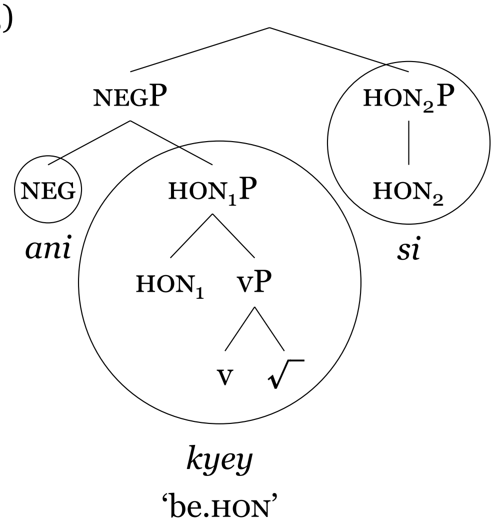
Then, *iss* 'be, exist' also has a suppletive negative form *eps* 'not exist', whose lexical entry is as given in (72):

(72)

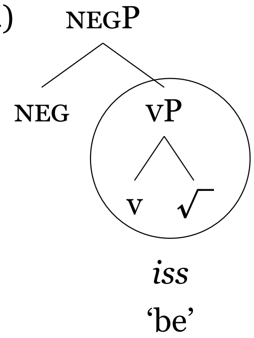


What do these entries predict about the interaction between honorification and negation? In order to see that, consider the fact that the applicability of a negative suppletive form is always evaluated at NEGP. The suppletive item applies when NEG has a sister that has been spelled out by a particular lexical item. Therefore, in order to determine the applicability of (72), we need to look at whether the sister to NEG is spelled out by *iss* 'be' or not. The examples in (73) and (74) show the relevant structures.

(73)



(74)



What we see here is that in the honorific structure (73), the HON$_1$P is spelled out by the honorific suppletive form *kyey*, not *iss*. Therefore, the negative suppletive *eps* does not match the NEGP in (73), and we correctly get the spellout *ani kyey* 'not be.HON.' The consequence is that in this case, the presence of HON does block negative suppletion. This is different from the non-honorific structure, where *iss* is the only candidate for spellout. Therefore, (74) is correctly predicted to be realised as *eps* 'not be'.

The solution to the paradox relies on the most basic essence of the pointer hypothesis: namely that suppletive lexical items point one to the other, and each spells out a structure of a different size. Since *al* is ambiguous between spelling out HON1P and vP, the form *molu* 'NEG.know' inherits this ambiguity and we find it both in the honorific and non-honorific environments. However, 'be, exist' is not ambiguous in the same way: we find *iss* in non-honorific environments, and *kyey* in honorific environments. The negative suppletive *eps* 'not be' has a pointer to *iss*, and it therefore inherits the distribution of *iss*, and both are only found in non-honorific contexts.

Importantly, this solution maintains the idea that suppletive roots spell out structures of different sizes, and therefore, they never compete with each other: there is no point in the derivation where both *eps* 'not be' and *iss* 'be' can be inserted. Since we do not need competition among suppletive lexical items, we can maintain the idea that whenever multiple roots match, the choice between them is free.

Conclusion

This paper has proposed an approach that reaches an important theoretical goal, namely to allow for root suppletion within a theory of narrow syntax that adopts the Strong Modularity Thesis, which holds that syntax is both phonology-free and concept-free. By dispensing with indexed $\sqrt{\ }$s, the theory is also compatible with approaches where $\sqrt{\ }$s are dispensed with altogether (Ramchand, 2008). What makes this type of theory available is a bottom-up phrasal lexicalisation, where $\sqrt{\ }$s are kept distinct from morphological roots. The latter come in a variety of classes, each class associated with a particular amount of functional structure.

We have further explained why and how such a theory is compatible with the fact that suppletion often co-occurs with overt marking. In order to test the predictions, we looked at the details of comparative/superlative suppletion in English, Czech and Latin. What we found is that suppletion in these languages is inevitably correlated with the reduction of overt morphology, which supports the empirical predictions of the model.

We finally discussed a paradox involving suppletion in Korean involving the interaction of negation and honorification in suppletion. Depending on the verb, different patterns are observed, which lead Choi and Harley (2019) to argue that allomorphy can be conditioned non-locally, across an intervening head. We discussed two cases which represent a similar type of configuration, but that does not give rise to allomorphy, and concluded that allomorphy must be conditioned strictly locally after all. Our solution to the Korean paradox consisted in a postulation of two different HON heads, one below and one above negation. The different behaviour of different verbs when negation and honorification interact could then simply be attributed to the different lexical entries for the relevant suppletive roots. Our theory of suppletive roots as involving pointers in lexical entries moreover ensured the correct distribution of suppletive roots, without having to take recourse to indexed $\sqrt{\ }$ nodes. We could thus maintain the Strong Modularity Thesis, with a phonology- and concept-free syntax, and with free choice of the root at the first cycle of insertion.

References

ARREGI, K.; NEVINS, A. A monoradical approach to some cases of disuppletion. *Theoretical Linguistics*, v. 40, n. 3-4, p. 311–330, 2014.

BACHMANNOVÁ, J. Okrajové úseky severovýchodočeské nářeční oblasti z pohledu celočeského (Na materiálu korespondenční ankety ÚJČ). *Naše řeč*, v. 90, p. 7–19, 1 2007.

BLIX, H. Spans in South Caucasian agreement: Revisiting the pieces of inflection. *Natural Language & Linguistic Theory*, Springer, v. 39, p. 1–55, 2021.

BOBALJIK, J. Distributed Morphology. In: LIEBER, R. et al. (Eds.). *The Oxford Encyclopedia of Morphology*. Oxford: Oxford University Press, 2017.

______. Syncretism without paradigms: Remarks on Williams 1981, 1994. In: BOOIJ, G.; MARLE, J. VAN (Eds.). *Yearbook of Morphology 2001*. Dordrecht: Kluwer, 2002. p. 53–85.

______. The ins and outs of contextual allomorphy. *University of Maryland Working Papers in Linguistics*, v. 10, p. 35–71, 2000.

______. *Universals In Comparative Morphology*. Cambridge, MA: MIT Press, 2012.

CAHA, P.; DE CLERCQ, K.; VANDEN WYNGAERD, G. The Fine Structure of the Comparative. *Studia Linguistica*, v. 73, n. 3, p. 470–521, 2019. DOI: https://doi.org/10.1111/stul.12107.

CAHA, P.; PANTCHEVA, M. Contiguity beyond linearity. Talk at Decennium: The first 10 years of CASTL, Sept. 2012.

CHOI, J.; HARLEY, H. Locality domains and morphological rules. Phases, heads, node-sprouting and suppletion in Korean honorification. *Natural Language & Linguistic Theory*, v. 37, p. 1319–1365, 2019.

CHUNG, I. Suppletive negation in Korean and distributed morphology. *Lingua*, v. 117, p. 95–148, 2007.

______. Suppletive verbal morphology in Korean and the mechanism of vocabulary insertion. *Journal of Linguistics*, v. 45, n. 3, p. 533–567, 2009.

DE BELDER, M.; VAN CRAENENBROECK, J. How to Merge a Root. *Linguistic Inquiry*, v. 46, p. 625–655, 2015.

DE CLERCQ, K.; CAHA, P., et al. Degree morphology. In: ACKEMA, P. et al. (Eds.). *The Wiley Blackwell Companion to Morphology*. Oxford: Blackwell, to appear.

DE CLERCQ, K.; VANDEN WYNGAERD, G. *ABA revisited: evidence from Czech and Latin degree morphology. *Glossa*, v. 2, n. 1, 69: 1–32, 2017.

______. On the idiomatic nature of unproductive morphology. In: BERNS, J.; TRIBUSHININA, E. (Eds.). *Linguistics in the Netherlands*. Amsterdam: Benjamins, 2019. p. 99–114.

______. Unmerging Analytic Comparatives. *Jezikoslovlje*, v. 19, n. 3, p. 341–363, 2018.

DOKULIL, M. et al. *Mluvnice češtiny 1. Fonetika. Fonologie. Morfologie a morfemika. Tvoření slov*. Praha: Academia, 1986.

EMBICK, D. Linearization and local dislocation: Derivational mechanics and interactions. *Linguistic analysis*, v. 33, n. 3-4, p. 303–336, 2007.

______. *Localism versus Globalism in Morphology and Phonology*. Cambridge, MA: MIT Press, 2010.

GILDERSLEEVE, B. L.; LODGE, G. *Latin Grammar*. London: MacMillan and Co., 1903.

HALLE, M. Distributed morphology: impoverishment and fission. *MIT Working Papers in Linguistics*, v. 30, p. 425–449, 1997.

HALLE, M.; MARANTZ, A. Distributed morphology and the pieces of inflection. In: HALE, K.; KEYSER, J. (Eds.). *The View from Building 20*. Cambridge, MA: MIT Press, 1993. p. 111–176.

HARLEY, H. On the identity of roots. *Theoretical Linguistics*, v. 40, p. 225–276, 2014.

HARLEY, H.; NOYER, R. Mixed Nominalizations, Short Verb Movement and Object Shift in English. In: ______. *Proceedings of the North East Linguistic Society*. University of Toronto: Graduate Linguistic Student Association, 1998. p. 143–158.

______. State-of-the-article: distributed morphology. *Glot International*, v. 4, p. 3–9, 1999.

HAUGEN, J. D.; SIDDIQI, D. Roots and the Derivation. *Linguistic Inquiry*, v. 44, p. 493–517, 2013.

______. Towards a Restricted Realization Theory: Multimorphemic Monolistemicity, Portmanteaux, and Post-linearization Spanning. In: SIDDIQI, D.; HARLEY, H. (Eds.). *Morphological metatheory*. Amsterdam: John Benjamins, 2016. p. 343–385.

KARLÍK, P.; NEKULA, M.; RUSÍNOVÁ, Z. *Příruční mluvnice češtiny*. Praha: Nakladatelství Lidové noviny, 1995.

KIM, J.-B.; SELLS, P. Korean honorification: a kind of expressive meaning. *Journal of East Asian Linguistics*, v. 16, n. 4, p. 303–336, 2007.

KIPARSKY, P. 'Elsewhere' in phonology. In: ANDERSON, S.; KIPARSKY, P. (Eds.). *A Festschrift for Morris Halle*. New York: Holt, Rinehart & Winston, 1973. p. 93–106.

KŘIVAN, J. Komparativ v korpusu: explanace morfematické struktury českého stupňování na základě frekvence tvarů. *Slovo a slovesnost*, v. 73, p. 13–45, 2012.

MARANTZ, A. A late note on late insertion. In: KIM, Y. S. et al. (Eds.). *Explorations in generative grammar: A festschrift for Dong-Whee Yang*. Seoul: Hankuk, 1994. p. 396–413.

______. Case and Licensing. In: ______. *Eastern States Conference on Linguistics*. Cornell University, Ithaca, NY: Cornell Linguistics Club, 1991. p. 234–253.

______. Cat as a phrasal idiom: consequences of late insertion in Distributed Morphology. ms., MIT, 1996.

______. Implications of Asymmetries in Double Object Constructions. In: MCHOMBO, S. A. (Ed.). *Theoretical Aspects of Bantu Grammar 1*. Stanford University: CSLI Publications, 1993. p. 113–151.

MARANTZ, A. No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of your own Lexicon. In: DIMITRIADIS, A. et al. (Eds.). *University of Pennsylvania Working Papers in Linguistics*. University of Pennsylvania, 1997. v. 4. p. 201–225.

MARTIN, S. E. *A reference grammar of Korean. A complete guide to the grammar and history of the Korean language*. Rutland, VT: Tuttle Publishing, 1992.

MATUSHANSKY, O. More or better: On the derivation of synthetic comparatives and superlatives in English. In: MATUSHANSKY, O.; MARANTZ, A. (Eds.). *Distributed Morphology Today: Morphemes for Morris Halle*. Cambridge, MA: MIT Press, 2013. p. 59–78.

MERCHANT, J. How Much Context Is Enough? Two Cases of Span-Conditioned Stem Allomorphy. *Linguistic Inquiry*, v. 46, p. 273–303, 2015.

MILLER, P.; PULLUM, G.; ZWICKY, A. The Principle of Phonology-Free Syntax: four apparent counterexamples in French. *Journal of Linguistics*, v. 33, p. 67–90, 1997.

MOSKAL, B. *A Case Study in Nominal Suppletion*. 2013. dissertation – University of Connecticut, Storrs, CT.

MOSKAL, B.; SMITH, P. W. Towards a theory without adjacency: hyper-contextual VI-rules. *Morphology*, v. 26, n. 3, p. 295–312, 2016. ISSN 1871-5656. DOI: 10.1007/s11525-015-9275-y.

OSOLSOBĚ, K. Komparativ. In: KARLÍK, P.; NEKULA, M.; PLESKALOVÁ, J. (Eds.). *Nový encyklopedický slovník češtiny*. Praha: Nakladatelství Lidové noviny, 2016. p. 839. ISBN 978-80-7422-480-5.

PFAU, R. *Features and categories in language production*. 2000. PhD thesis – Johann Wolfgang Goethe-Universität, Frankfurt am Main.

______. *Grammar as processor: a distributed morphology account of spontaneous speech errors*. Amsterdam: Benjamins, 2009.

POMINO, N.; REMBERGER, E.-M. Verbal Suppletion in Romance Synchrony and Diachrony: The Perspective of Distributed Morphology. *Transactions of the Philological Society*, v. 117, n. 3, p. 471–497, 2019.

RADKEVICH, N. *On Location: The structure of case and adpositions*. 2010. dissertation – University of Connecticut, Storrs, CT.

RAMCHAND, G. *Verb Meaning and the Lexicon*. Cambridge: Cambridge University Press, 2008.

STARKE, M. Complex Left Branches, Spellout, and Prefixes. In: BAUNAZ, L. et al. (Eds.). *Exploring Nanosyntax*. Oxford: Oxford University Press, 2018. p. 239–249.

______. Nanosyntax: A Short Primer to a New Approach to Language. *Nordlyd*, v. 36, p. 1–6, 2009.

STARKE, M. Why you can't stay away from clitics. Talk presented at GIST 7, Ghent, June 2014.

VANDEN WYNGAERD, G. The feature structure of pronouns: a probe into multidimensional paradigms. In: BAUNAZ, L. et al. (Eds.). *Exploring Nanosyntax*. Oxford: Oxford University Press, 2018. p. 277–304.

VANDEN WYNGAERD, G. et al. How to be positive. *Glossa*, v. 5, n. 1, p. 23. 1–34, 2020.

ZWICKY, A. Phonological constraints in syntactic descriptions. *Papers in Linguistics*, v. 1, p. 411–453, 1969.

ZWICKY, A.; PULLUM, G. The Principle of Phonology-Free Syntax: introductory remarks. *Working Papers in Linguistics*, v. 32, p. 63–91, 1986.